



Sustainability in practice

A collection of success stories from the dairy industry

Meet a few of the people working to protect our future.

The future of dairy depends upon a healthy environment and a strong economy. That's why people at every step in the process, from dairy farmers to processors to your local grocer, have always looked for ways to work sustainably and economically.

That is the foundation of the U.S. Dairy Sustainability Commitment. Working with environmental, academic and scientific organizations from around the world, we're finding new sustainability solutions for the entire dairy industry. People across the country are implementing these ideas to deliver healthy, nutritious dairy in smart ways that sustain our families, our communities and our planet.

Here you'll find a collection of success stories – real examples of the commitment in action. Producers and processors are working with the Innovation Center for U.S. Dairy to find ways to increase energy efficiency, reduce waste, save fuel and lower operating costs. The people here are a sampling of those leading the way toward a strong, sustainable dairy industry.

The U.S. Dairy Sustainability Commitment builds on a legacy of caring for the land and the environment while producing and delivering fresh, wholesome foods.



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Alliance Dairies

As a Florida dairy farmer, Ron St. John strives to be an environmental steward and good neighbor. He has implemented several farming methods that either reduce or eliminate stress on the sensitive lands and waters of the Suwannee River Basin that surround Alliance Dairies, his farm in Gilchrist County.

Underneath the housing operation where his 4,000 milking cows live and eat, a concrete base was installed to prevent any waste from reaching the aquifer, providing a layer of protection between St. John's herd and the earth. The concrete is flushed every day with recycled water, which is then tunneled into a lined concrete lagoon. From there, the water – or effluent – is pumped onto crops at Alliance that are grown on 2,500 acres specifically for cow feed.

Compared with most Florida dairies, Alliance grows a higher percentage of its cow feed on site. St. John says he is able to produce about 70 percent of his forages at Alliance and has a goal of reaching 80 percent. Also, to reduce transportation costs and greenhouse gas emissions, Alliance purchases its corn from Southeastern states.

St. John began utilizing a soil conservation method called strip tilling that also greatly reduces fuel costs and emissions by using fewer tractors. The width of the rows is determined by each crop so that the crops can sprout quickly to form canopies, preventing weeds from growing and the need to control them. Elsewhere at Alliance, other crops are grown utilizing technology that features a natural resistance to pests.

St. John's efforts were recently recognized when he was named a 2008 County Alliance for Responsible Environmental Stewardship (CARES) designated farmer by the Florida Farm Bureau and the Suwannee River Partnership. St. John owns three other dairies in addition to Alliance – Southpoint in Levy County, and Piedmont and Watson in Gilchrist County.



Aurora Organic Dairy

Aurora Organic Dairy in Boulder, Colo.,

has had sustainability on its mind since the farm was established in 2004. As a producer and processor of private label organic milk and butter, Aurora Organic Dairy continuously searches for improvement opportunities in all steps of the operation, whether it's crop production, animal welfare, milk quality, processing techniques or transportation efficiency.

Sustainable practices already in place at Aurora Organic Dairy focus on resource conservation while maintaining product quality. Some practices include:

- ▶ Manure dry-vac that replaces water flush, saving 400,000 gallons of water per year
- ▶ 100 percent of milk parlor wash water is recycled for crop and pasture irrigation
- ▶ Compost is used to improve soil and nourish crops
- ▶ Processing plant was built using LEED certification guidelines for energy-efficient lighting, variable speed and high-efficiency motors, heat exchangers and insulation

In 2008, Aurora Organic Dairy partnered with the University of Michigan's Center for Sustainable Systems to launch a life cycle assessment (LCA) of the dairy's operation – from seed to shelf. Because the dairy is vertically integrated, it has the opportunity to control all aspects of production and processing. The first phase of the LCA will determine Aurora Organic Dairy's carbon footprint and overall energy use. A second phase will identify opportunities to help the dairy become more efficient and improve its sustainability performance, while also analyzing other sustainability factors, such as water use, solid waste disposal and nutrient loads.

"We intend to learn as much as we can about how to make organic agriculture even more sustainable," says Mark Retzloff, chairman of Aurora Organic Dairy. "Our goal is to share what we learn with our network of more than 120 family farmers and the organic agriculture community as a whole."



Becker Farm

"This farm is our legacy. We want our friends and neighbors to enjoy this view long after we're gone," says Jed Becker, owner of Becker Farm in Iowa. "That's just one of the reasons we work so hard to care for our land and animals."

It's not surprising to learn, then, that the Beckers make sure their herd enjoys the great outdoors as much as possible. Their cows can almost always be found soaking up the scenery and, most importantly, lopping off mouthfuls of country-fresh grass. Fresh grass is the main course for the Becker herd because Jed and his wife, Joyce, use a rotational grazing system to feed their cows.

"The herd spends its time between milkings in a pasture paddock eating grass," Jed Becker says. "When the majority of the grass has been eaten, we move the cows to a new paddock, allowing the old one to renew itself before being used again."

The Beckers' 240 acres of corn, oats, soybeans and hay make for a bountiful harvest every fall. Plentiful yields are the result of the decisions the Beckers make year-round. Strips of natural vegetation are left next to the creek, so the soil isn't washed away during heavy spring rains. In addition, local specialists test the soil frequently so the proper nutrients can be added. What's more, Becker scouts crops: he walks through the fields each summer as the crops grow, checking for weeds and insects. This helps him identify the proper pest and weed management methods.

It's easy to see how this system provides Becker's animals with comfort and nutrition; however, rotational grazing, land conservation and crop scouting also are good examples of how many dairy farmers are taking good care of the land they call home.

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Besancon Farms

Besancon (Beh-ZAN-son) Farms is a 260-head dairy operation in Ohio. At first glance, the dairy might seem traditional in its practices – and that’s by design. Brent Besancon credits his father with instilling the philosophy of doing things right and making them last a long time. On the farm, that deceptively simple approach means making changes that make sense for this dairy, not just going to the latest and greatest equipment, facilities, etc.

But sustainable practices abound at the farm – especially social sustainability. It starts with Besancon’s hiring philosophy. The farm only hires locally, within its county, and 90 percent of the workforce is high school- or college-aged. Brent was 22 when he purchased the dairy from his father, and he is committed to building the next generation’s workforce in the same way. He acknowledges it takes a bit more work to manage a large staff of kids who are working around school and other commitments, and there’s certainly a great deal of teaching involved. But for Besancon, that’s the most rewarding thing he can do. In fact, he recently attended the graduation ceremony for a longtime employee of his (since sixth grade!) who is now a veterinarian – and he couldn’t be prouder.

As Besancon says, it’s worth any amount of money he could save by hiring adult, full-time professional workers to be able to send these young people into the workforce with the knowledge and skills he’s taught them.

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Blue Spruce Farm, Inc.

When Marie Audet travels around her native state of Vermont wearing her Blue Spruce Farm T-shirt, she is often greeted by grateful customers.

"People come up to me and say, 'Oh, I buy Cow Power!' and it's really nice – I get to say, 'Thank you so much!'" Audet says.

The Audets never intended to become celebrity farmers, but the appreciation for the energy their methane digester produces is welcome. Garnering attention wasn't Blue Spruce Farm's goal when it became the first dairy to join Vermont's well-received Cow Power program; the farm was making a business investment and practicing good stewardship by reducing its greenhouse gas emissions and offering a sustainable energy source to its neighbors.

In 2005, the Central Vermont Public Service Corporation developed the Cow Power program, giving customers the option of buying electricity generated from cow manure. There are 1,200 milking cows at Blue Spruce. Together, they produce 35,000 gallons of manure daily. Thanks to an anaerobic digester, all that manure is given new purpose when collected and placed in the biodigester. Inside the apparatus that resembles a concrete, covered, in-ground pool, excess heat from the generator keeps the manure at the same temperature as the inside of the cow's stomach, allowing the digestion process to continue. In the 16-foot-deep digester, manure fills 14 feet, allowing 2 feet at the top for the methane gases to collect. That methane goes through generators that transfer the power into a utility grid that supplies power for 4,000 customers – among them independent businesses and homeowners.

Unlike other types of renewable energy, manure is consistent, producing power 24 hours per day, seven days per week. The farm receives payment for the electricity from a combination of a recently state-legislated Feed in Tariff program and Cow Power customers' payments.



"People laughed at me, at the notion of asking people to pay a little extra for something they believe in," said David Dunn, CV Public Services Cow Power project leader.

Any skeptics are quiet now. The demand for renewable energy is great.

For the Audets, investing in the digester was the right thing to do, environmentally and financially. After powering the electricity grids, the manure is separated into liquid and solids. An improved nutrient-rich, liquid fertilizer is applied to the Blue Spruce fields, helping to produce the crops that eventually end up back in the digester. The fluffy manure solids are used to make comfortable and clean bedding for the cows. The bedding produced on-site replaces a tractor trailer load of sawdust each week, costing \$2,000 per load. The digested manure solids are sold locally, providing the Audets with an additional income stream profit on top of their savings.

"It's helping five other farms to have affordable bedding for their cows," Audet says of this additional benefit to the digester's products. In fact, she feels an increased solidarity with other producers. "We have so much more in common than we have differences," she says.

Together, the Audet family has maximized the benefits of the methane digester to provide for its neighbors, its cows and itself. Nothing is waste until it is wasted. At Blue Spruce, even water has multiple purposes. Water from the milk-cooling system is used to provide the cows with water. Wastewater is collected and reused to wash the barn floors. Excess heat from the generator is captured through a heat exchanger and provides hot water to the farm for the daily cleaning of the milking system, and for radiant floor heat in the winter.

In addition to all of their recycling practices, the Audets recently worked with the Vermont Land Trust to conserve 441 acres of farmland near their current facility. Their work transcends dairy farming, although Audet never loses sight of the joy in being a food producer.

"It's a good feeling that you're helping to feed people," she says. "It's an honorable job."

It is no wonder that the Audets have achieved acclaim in the world of farming. Any celebrity status they have earned through their creative environmental protection is more than deserved.



Borba Dairy

The Borba Dairy is a third-generation dairy farm in California that uses multiple sustainable management techniques and is always looking to improve its practices. In 2003, George Borba moved his family to Kern County, Calif., after 80 years of his family farming in the Chino, Calif., area. This move wasn't the only big change the Borba family embraced. They began implementing new technology to help their dairy farm become more sustainable.

Their farm practices manure recycling and re-use, capturing nutrients to grow feed for their cows. They use plastic covers to limit silage emissions and recycle water to irrigate their crops. Borba Dairy has a long history of commitment to continuous improvement through sound research and good investments in new technology. In fact, the dairy was the first in the state to undergo the highest environmental review under the 1970 California Environmental Quality Act. The Environmental Impact Report includes analyses of each aspect of the dairy production chain. Borba's willingness to undergo such a thorough investigation is a testament to his belief in his farm's good practices.

"We're a lot more environmentally aware these days," Borba says. "We have a lot more knowledge, more tools, and we're using them."

Borba's commitment to sustainable farm practices is personal. By implementing new technology to improve his dairy production, Borba is paying tribute to his grandfather, who came to the United States in 1918 with only a sixth-grade education and began Borba Dairy. He also is paying tribute to his four children, who will one day inherit the farm and, of course, the land.



Cedar Grove Cheese

As a Wisconsin Master Cheesemaker[®], Bob Wills is committed to environmentally sound production practices. Wills is the head of Cedar Grove Cheese, a specialty and traditional cheese company in Plain, Wis. His commitment extends beyond his organic cheese production to on-site recycling programs and energy-reduction practices.

In 2000, Wills installed an earth-friendly and cost-effective way to handle the 7,000 gallons of wash water used daily in his specialty cheese factory. Named the Living Machine, this elaborate wastewater treatment facility is located in an on-site greenhouse and mimics the water cleansing properties of wetlands by utilizing microorganisms and plants. It was developed by Living Technologies Ltd., based in Vermont.

At the end of the complex treatment process, wastewater is filtered into clean water and returned to the ecosystem via nearby Honey Creek, a small, pristine waterway in the Wisconsin River Basin that winds through Sauk County's rich dairyland.

"The natural process of treating our wastewater helps us remember that what goes down the drain matters," Wills says.





The manure digester produces enough electricity to power the Craves' farm, the cheese factory and 120 nearby homes.



Waterloo,
Wisconsin

Crave Brothers Farm & Farmstead Cheese

The Crave Brothers Dairy Farm and Crave Brothers Farmstead Cheese of Waterloo, Wis., have been innovative in their approach to building a sound family business while seeking ways to be environmentally responsible and sustainable. A prime example is the methane digester they built on their farm to convert cow manure to electricity.

Anaerobic (oxygen-free) digestion is a biological process in which microorganisms break down organic waste in a process that ultimately produces gas, mainly methane with some carbon dioxide. This gas can be burned just like natural gas, thus generating energy. The manure digester produces enough electricity to power the Craves' farm, the cheese factory and 120 nearby homes.

"The digester helps manage our farm's manure; provides clean, renewable energy for the farm; and produces excess electricity, which Clear Horizons sells on the grid," says George Crave, one of four brothers who farm together with their families.

Clear Horizons, a Wisconsin firm that specializes in organic waste management solutions and biogas energy systems, owns the digester and operates it over the Internet from the company's Milwaukee office. Karl Crave, another family member involved in the business, works for Clear Horizons.

"The digester reduces odor from the manure and also provides some additional salable products," says Crave. "We use the liquid byproducts as fertilizer on our fields and the solid byproducts [dry organic matter] are used as animal bedding and in a line of organic potting soil."



Dairy Farmers Of America, Inc.

Dairy Farmers of America, Inc., (DFA) members have learned that a healthy environment often means a healthy business.

"By embracing our core values, which include innovation, we employ practices that not only benefit the environment, but also generate significant value for our members," explains David Darr, vice president of sustainability and public affairs. "At DFA, sustainability is about building long-term value for members and the organization through practices that make or save money and reduce our impact on the environment."

Below are just a few of the many sustainability initiatives happening throughout DFA on the farm and in the office.

On the Farm

Many DFA members are taking steps toward sustainability that have earned the dairy industry praise in its proactive approach to reducing pollution and protecting the environment. DFA honors many of these members with Gold Standard Dairy Program recognition. This program identifies quality farms in six areas, including environmental stewardship. Others are recognized with outside awards. Carl and Janet Ayers of Perrysville, Ohio, were honored with the Ohio Livestock Coalition's 2009 Dairy

Environmental Stewardship Award for developing and implementing exemplary conservation and stewardship management practices. The Ayers are using no-till planting equipment, cover crops, sod waterways and watershed control basins to achieve zero erosion and to increase soil organic matter and nutrient-retaining levels for optimum crop production.

Through basic manure management, many members have reduced the need to purchase artificial fertilizers for their fields. Randy Mosel of Neligh, Neb., for instance, uses calcium on his soybeans, resulting in healthier, larger plants with the end goal of eventually eliminating the need for commercial fertilizer on his fields.

With biodigester technology, some members, such as Louis Aragi Jr. of Sheffield, Mass., are turning their cows' waste into valuable biogas and electricity while generating new revenue streams. Still more producers, like Randy Walker of Eagle Bridge, N.Y., are installing environmentally friendly lighting fixtures in the milking parlor to lower electricity use, saving thousands of dollars each year.

According to the *Journal of Animal Science*, with improved feeding programs and animal genetics, dairy farmers have reduced the carbon footprint of their products by 63 percent during the last 60 years.

When manure is used as a soil treatment, the water-holding capacity of soil is increased by 20 percent, according to *Dairy Farming Today*. This results in reduced groundwater needed to grow crops.





Kansas City, Missouri

Milk Hauling

To get the billions of pounds of milk from farms to production facilities, DFA markets the equivalent of 3,352 full truckloads of milk each day, traveling 1 million miles and burning nearly 16,000 gallons of fuel per truck each year. Not only does this fuel cost money (at \$2.80 per gallon, haulers are spending \$44,800 per truck annually on diesel), but burning the fuel emits air pollutants such as carbon dioxide, carbon monoxide and sulfur dioxide.

DFA's Supply Chain department is working with milk haulers to reduce fuel use and idle time while improving safety and fleet maintenance. In 2007, the Mountain area DFA council worked with Zonar Systems to implement an electronic fleet-management system in DFA-operated milk trucks. The technology uses a GPS-based tracking system that collects data about fuel consumption, inspection and maintenance, routes and driving habits. Data is automatically transmitted to fleet managers who use it to evaluate drivers and make decisions about routes that encourage a more efficient, more economical fleet.

In the first eight months of using the technology, idling-time fuel expenses decreased by 85 percent simply through behavioral changes. This program is saving nearly \$300,000 per year in diesel expenses in the Mountain area council alone. Use of the GPS technology has allowed DFA to more accurately predict arrival times at farms and processing plants, leading to more efficient time and route management. DFA is currently piloting this technology with milk hauling partners in its other area councils.

Finished Goods Transportation

A new distribution model being used for DFA's retail business relies on transportation management software that optimizes truckloads to reduce the number of trips required to deliver goods, thus saving fuel, reducing emissions and generating cost savings of around \$2.4 million each year.

Additionally, DFA is evaluating the use of third-party regional distribution centers for finished goods. This would allow for more efficient distribution of customer orders that are less than a normal

truckload. It is estimated this program may reduce transportation costs up to 5 percent.

Manufacturing and Processing

In 2008, DFA plant employees began reporting sustainability information into a central database that allows plant managers to compare their performance to other facilities using key indicators such as electricity, gas and water consumption, as well as wastewater discharges. This centralized snapshot of plant performance allows DFA plants to focus on increasing efficiency, reducing waste and sharing best practices.

Plant managers at numerous DFA facilities in 2008 identified equipment and process upgrades that would save water, energy and money, including piping upgrades, new cleaning systems and improved boiler technology.

When all of these improvements are fully implemented, they are projected to save more than 14 million gallons of water per year – the equivalent water usage of 144,000 American households. Annual financial savings are estimated at \$1.4 million.

At the New Wilmington, Pa., cheese plant, DFA plant employees are saving money and the environment through methane-capture techniques, using it in the boiler at the wastewater facility. The benefits are many: methane, rather than escaping into the atmosphere, is burned and becomes a less potent greenhouse gas; the captured biogas displaces the need to buy and burn natural gas; and the odor from the plant is greatly reduced. Using this method in 2009 was equivalent to taking 1,539 cars off the road.

By encouraging innovation and collaboration throughout DFA and by helping members identify the resources they need to implement sustainability measures, employees continue to contribute to the cooperative's mission of creating value for its members.

Dairy farmers have reduced their carbon emissions by 63 percent, which Cornell University says is the equivalent of taking 32 million cars off the road.

Dean Foods Company

Dean Foods Company, headquartered in Dallas, is proud of the wholesome, nutritious products it manufactures and sells, and the vital role these products play in creating healthy lifestyles. At the same time, Dean Foods recognizes that its operations have a significant impact on the environment and a responsibility to manage that impact.

In 2007, Dean Foods compiled its first comprehensive greenhouse gas emissions inventory. Since then, the company has submitted overall data for its 2006 and 2007 emissions to the Carbon Disclosure Project, and facility-level data for its California operations to the California Climate Action Registry. In 2008, the company published its Environment 2013 Roadmap, which prioritizes the efforts to reduce its impact on the environment in three key areas: GHG emissions, water usage and solid waste. In addition to these environmental benefits, the Roadmap will pave the way for improved efficiencies, resulting in added business value to the company and its shareholders.

These actions will lead to the company's goal of reducing its carbon footprint by 20 percent before 2013 through energy-efficient initiatives, renewable energy investments and industry collaborations. Some examples of projects Dean Foods expects to implement to reduce GHG emissions from plant operations include:

- ▶ Conversion of biogas into energy
- ▶ Adopting high-efficiency technology, such as automatic shut-off on hoses, to reduce water usage
- ▶ Investing in methane recovery systems
- ▶ Utilizing cogeneration, or combined heat and power (CHP) plants as a viable, cleaner alternative to traditional energy sources
- ▶ Launching the Smart Fleet Initiative to improve transportation efficiencies

"Dean Foods acknowledges the responsibility we all share to improve the world around us and we are absolutely committed to doing our part," says Gregg Engles, CEO of Dean Foods Company. "We know that by taking these actions today, we will be fortifying our future for generations to come."



Fair Oaks Farms

If the cows aren't happy, nobody's happy. That's the philosophy at Fair Oaks Farms in Fair Oaks, Ind., which houses 30,000 cows on 10 dairy sites owned by the Bos, den Dulk, McCloskey, Schakel and Van Ravenswaay families. Fair Oaks Farms are environmentally conscious dairy farms that place a special emphasis on animal husbandry, which is casually referred to as cow comfort.

"Cow comfort is one of the most important things a dairy farmer can do for his or her cows," says Mike McCloskey, president of Fair Oaks Farms and a licensed veterinarian. "When animals are happy and treated well, they respond by producing a greater amount of milk."

Each of the happy cows at Fair Oaks Farms produces almost 10 gallons of milk per day, which is enough fluid milk to supply all the citizens of Chicago with milk each year, McCloskey said. According to the U.S. Department of Agriculture, the average dairy cow produces 6 gallons of milk per day.

A staff of veterinarians, animal nutritionists and herdsman are available 24 hours a day to attend to any cow's health needs. That includes practices such as protecting cows from wind and moisture, keeping water

troughs clean and warm, and keeping their walking areas clear. Instead of lying down on dirt beds or mattresses, many of the cows at Fair Oaks Farms have inorganic sand beds. The sand does not support the growth of bacteria, and adjusts to the weight distribution of the cow. This creates less pressure on the cow's ankles and knees when lying down.

The health and wellness of the cows at Fair Oaks is just one aspect of the farms' commitment to being responsible stewards of the environment. The farms operate on what McCloskey calls a "closed loop system." Fair Oaks Farms grows its own corn silage and alfalfa for cow feed. The cow manure is put in a methane digester and then transferred as a gas to generators that power the farms. The digester biosolids are applied to the fields to renew the top soil, and the liquid is used for irrigation. Solid or liquid, the nutrients feed the land and start the cycle all over again.

"More than 400,000 visitors come to Fair Oaks Farms every year to see how our farming practices produce our most nutritious source of calcium while protecting the soil and water for future generations," McCloskey says.

Fair Oaks Farms are environmentally conscious dairy farms that place a special emphasis on animal husbandry, which is casually referred to as cow comfort.



Middlebury,
Vermont

Foster Brothers Farm

Foster Brothers Farm in Vermont

is a fifth-generation dairy that has operated under a sustainability philosophy for years. For Bob Foster, this means trying to “close the loop” on the farm – to be as efficient as possible.

The farm has had an aerobic digester since 1982, producing enough electricity to power the dairy and sell the excess power to the local grid. Foster Brothers also developed a composting operation that produces

high-quality product that can be used instead of commercial fertilizers – an operation that has been running for 15 years. Today, the farm is looking at converting excess nutrients from the composting operation into growing algae and producing either oil or hydrogen.

Foster believes dairy can do a lot to provide a more sustainable food system, and that the industry’s history of good stewardship and citizenship gives us a unique opportunity to do that.

Foster Brothers also developed a composting operation that produces high-quality product that can be used instead of commercial fertilizers ...



Contributing to healthy diets and a healthy planet.



Green Mountain Dairy

In 2005, brothers Bill and Brian Rowell filled out a grant application the size of a Sears catalog. The hefty paperwork delivered \$755,000 from government agencies to finance a \$2.2 million anaerobic digester project. Using the digester to produce electricity for their neighbors in Vermont is just one of the ways the Rowells' Green Mountain Dairy is leading the way in sustainability. Of the many reasons that implementing sustainable practices makes sense in the dairy industry, Bill Rowell finds the most important one in the faces of the next generation. Rowell is working to guarantee that his niece and nephew, Megan and Matthew, will inherit a sustainable farm.

The digester project was viewed as an economic and environmental management tool to help ensure a sustainable future for Green Mountain Dairy. The Rowells had heard about digesters in use on farms in Europe, and recognized the great economic and ecological potential of using one. Green Mountain Dairy is one of four Vermont dairy farms turning manure into electricity through an anaerobic digester with the cooperation of Central Vermont Public Service – the local utility that buys renewable energy for the grid at wholesale prices through a program called Cow Power. Green

Mountain Dairy produces enough electricity each year to power about 400 average-sized homes. The people living in those homes have financial security that, as Bill Rowell puts it, “allows them an opportunity to buy a piece of environmental good.” The recently passed renewable energy bill in Vermont keeps the electricity that the dairy producers are selling at a fixed rate, providing a 20-year contract that will serve as an incentive for producers to join the Cow Power program.

The family's commitment to improving agriculture in the state of Vermont and beyond does not go unnoticed. Green Mountain Dairy was named Vermont's Dairy Farm of 2008 for its digester success, herd management and sustainability efforts. As if that weren't enough, the brothers are working with other impassioned producers from around the country to improve national dairy policy. Their mission is to transform the nation's dairy industry and equip it for generations of stability and sustainability. Bill Rowell serves as the vice president of an organization he helped found in 2006 called Dairy Farmers Working Together (DFWT). He is a pioneer of this movement, and he captures the occasional volatility of that when he says, “Pioneers take some risk; they take the unintended arrow from time to time.”

Green Mountain Dairy is one of four Vermont dairy farms turning manure into electricity through an anaerobic digester with the cooperation of Central Vermont Public Service – the local utility that buys renewable energy for the grid at wholesale prices through a program called Cow Power.



Those barriers to change can come in the form of government red tape, conflicting priorities along the supply chain, and a challenging economy for dairy producers with different ideas for solutions. In their work to achieve price stability, Rowell has found that employing smarter sustainable practices is at the forefront of the platform because it creates economic stability for dairy producers. On their farm, recycling is a way to help the environment and ensure the continued livelihood of the business. In addition to the electricity produced by the digester at Green Mountain Dairy, the liquid waste becomes an enhanced fertilizer, the dry solids are used for cow bedding, and extras are sold to garden stores. All of this creates savings and new revenue streams for Green Mountain. As Rowell says, "We're making a resource out of a waste stream."

The Rowells recognize their opportunity to "raise the bar for agriculture." Through his work at Green Mountain Dairy and with DFWT, Rowell spends each day working to ensure a bright future for the dairy industry. Rowell envisions a sustainable dairy system that thrives environmentally and economically. Green Mountain Dairy exemplifies those traits, and the family is eager to share its vision and farm's mission with visitors. Over the past three years, Green Mountain Dairy has hosted more than 12,000 people, all of them consumers, from more than 23 countries. These visitors have heard about Green Mountain Dairy, and are not disappointed when they meet the advocates who are strengthening an industry, offering a renewable energy and striding into the future.



Hardie Farms

Lansing,
New York

Hardie Farms is known for its innovation. As Skip Hardie says, "We've tried many different things. Some have been ahead of the curve and some weren't even close to the curve." Like many other dairy producers, Hardie developed sustainability practices before it was popular. In 1988, he installed a variable speed vacuum pump. The pump has saved Hardie Farms a considerable amount of electricity over the years and is a good example of a best management practice that works from both an economic and an environmental perspective.

As sustainability grows in popularity and performance, Hardie continues to implement new environmentally sustainable techniques in managing his farm.

One such technique is drag hosing. Early on, Hardie tried irrigation equipment to distribute manure. As he tells the story, it was "smelly, messy and generally a pain in the posterior." When the concept of drag hosing emerged, he quickly invested in it. Drag hosing spreads the liquid portion of the manure, not only minimizing odor, but also replacing expensive and unsustainable fertilizers. It uses much less energy, is neighbor-friendly, conserves nutrients and saves money.

"We've got to make the most efficient use of the nutrients we have here, and this in my mind is by far the best way to do it," Hardie says.

Drying and composting the manure solids has another benefit for Hardie Farms – it provides pathogen-free bedding for cows. This form of bedding is good for the cows and the environment.

"The [manure] solids come out as a dry, fluffy, nonsmelly material we're able to put where the cows lie down, and that's for their comfort and health," Hardie says.

Hardie hasn't stopped there. His sustainability efforts extend to other types of recycling. Once the oil runs through his farm's equipment, Hardie stores the waste oil and uses it to heat his farm shop facility during the winter.

All of these efforts are helping Hardie Farms be more sustainable and more economical. By reusing, recycling and repurposing, Hardie is doing a great job as a businessman and a steward of the earth.



Princeton,
Minnesota

Haubenschild Farms

Dennis Haubenschild is a longtime proponent of sustainability. If you ask him, he'll tell you that he began striving for "Earth-neutral farming," as he calls it, back in the 1970s.

He has a saying that "It only becomes waste if you waste it," and he's taken that philosophy to heart in the operation of Haubenschild Farms in Minnesota, of which he is president and owner. The state-of-the-art methane digester at Haubenschild Farms produces enough energy to run the entire dairy and 70 additional homes.

The farm is currently working with the University of Minnesota to develop a prototype for a hydrogen fuel cell technology system. They hope to find ways to fuel the farm's tractors by using hydrogen fuel cells made with biogas from the farm's digester.

The digester isn't the only sustainable practice in use at Haubenschild Farms. All water is used twice, and variable-speed pumps are employed as well. The farm also was the first to sell carbon credits on the Chicago Climate Exchange. Haubenschild believes a dairy of any size can put these practices into place – and that agriculture has the potential to supply up to 40 percent of U.S. energy.

Haubenschild was recognized by the International Dairy Foods Association (IDFA) for his progress in sustainability and renewable energy when he was named 2010 Innovative Dairy Farmer of the Year during the IDFA Dairy Forum. The award recognizes U.S. dairy producers who apply creativity, excellence and forward thinking to achieve greater on-farm productivity and improved milk marketing.

"Dennis Haubenschild is an innovative leader, a friend to the environment and a steward of the industry who uses education and experience to teach others," says Greg Steele, vice president of Agribusiness Capital for AgStar Financial Services, who nominated Haubenschild for the award.



The farm also was the first to sell carbon credits on the Chicago Climate Exchange.

Highland Farms

Nestled in the foothills of the White Mountains, just outside of Portland, Maine, sits Highland Farms – a dairy farm that's seen six generations of the Pike family producing high-quality milk. Highland Farms is the oldest continuously registered Jersey herd farm in the country, dating back to 1886. The Pike family started the farm in 1889 when buying its first two Jerseys.

Today, the farm is owned by four cousins: Libby Bleakney, Dan Palmer, David Pike and Lorie Pike. David Pike manages the field work and the logging business, cutting and chipping wood from the farm, which offers custom logging for other businesses. Palmer and Bleakney manage the dairy herd. Lorie Pike is a full-time teacher and milks part time and one day on the weekend.

Bleakney's twin daughters, Jennifer and Johanna, are graduates of the University of New Hampshire and work on the farm full time. Bleakney's other daughter Andrea often sneaks time away from her university studies to help Jennifer out in the milking parlor, and David Pike's son Chad is another member of the sixth generation who is involved in the farm.

This committed family farm is known for breeding great Jersey cows and employing progressive farming methods. The National Dairy Shrine recognized Highland Farms as the 1995 Distinguished Dairy Cattle Breeder. The farm has worked closely with its local conservation groups to ensure the farm is environmentally friendly. One of its many recycling practices is manure composting. The family also employs a drain tile and pond system – a complex network of ditches that ensure clean water distribution across the farm.

The milk from Highland Farms' cows is trucked to a local dairy processing facility several times each week, to ensure freshness and a high-quality end product. The farm averages more than 17,000 pounds of milk with 5 percent fat and 3.6 percent protein – a result of the higher butterfat of Jersey cows.

With such strong family ties and dedication to improving the environment, Highland Farms is sure to maintain its legacy for years to come.



The farm has worked closely with its local conservation groups to ensure the farm is environmentally friendly.

Rockwood,
Pennsylvania

Hillcrest Saylor Dairy

"I've always looked at new technologies and believed that you have to work with [them] to stay with the future," says Shawn Saylor, owner of Hillcrest Saylor Dairy, a century-old farm that has been passed down through four generations. He is using new technology to reduce waste and cut rising energy costs.

With a goal of zero waste, the farm was finally able to install a methane digester that would reduce carbon emissions and cut rising energy costs after receiving a \$600,000 grant in 2006 from Pennsylvania's Department of Environmental Protection.

Saylor says this proved to be a great investment, saving the business \$200,000 per year with a return on investment of five years or less.

The methane digester and the 600 cows that power it are able to not only produce enough energy to power the farm and a dozen neighboring homes, but have enough left over to sell back to the grid.

The digester has been a breath of fresh air for those who surround the farm, as it has reduced odor caused by cow manure by 98 percent. The leftover solid waste also is sold to the community and used for animal bedding.

Saylor has no plans of stopping here and in the future plans to make his farm entirely self-sufficient by using waste vegetable oil to make biodiesel fuel.



Saylor, the methane digester proved to be a great investment, saving the business \$200,000 per year with a return on investment of five years or less.



Hooley Digester

In the late 1980s, the Agricultural & Resource Economics department at Oregon State University (OSU) began studying mechanisms that reduced methane emissions and made additional improvements to Oregon's dairy industry. The one avenue of inquiry that clearly merited further investigation involved anaerobic digestion of dairy cow manure to generate energy; remove weed seeds and pathogens; improve local water and air quality; and generate potting soil, cow bedding and other fibrous material. Oregon's Congressional delegation was supportive of this investigation and secured roughly \$1.5 million for further study.

The investment paid off when, several years later, Oregon Congresswoman Darlene Hooley helped the Port of Tillamook Bay (POTB) secure public financing for a small-scale community digester, modeled on the work completed at OSU. Financing provided by the U.S. Department of Energy, in addition to grants from other agencies, helped to complete the Hooley Digester facility in 2001.

Today, the facility is up and running with:

- ▶ An entry lagoon where trucked effluent is deposited
- ▶ Three soft-topped, concrete-walled containment cells where effluent is heated/digested
- ▶ Two 200-kilowatt (kW) Caterpillar® electricity-generation units (gensets)
- ▶ One methane flare for burning excess gas
- ▶ A covered hopper area where fibrous material is deposited and dried

The digester separates the effluent into three streams: fibrous material, methane gas and treated liquid effluent. The liquid effluent, now pathogen-free, is trucked back to contributing farms for field application. The treated solids are sold as potting soil and animal bedding. The methane gas is converted into electricity and excess gas is flared.

The Hooley Digester processes manure from approximately 3,000 dairy cows. This reduces odor on the farm and results in pathogen-free organic fertilizer that promotes grass growth. It also creates a modest amount of electricity as well as rich potting soil and excellent animal bedding. An unintended benefit is that the digester reduces greenhouse gas (GHG) emissions by capturing and destroying methane.

POTB is currently working to expand the digester facility with the help of match money from the state of Oregon obtained by state Sen. Betsy Johnson. The match money, originating from a \$44.6 million FEMA compensation for storm damages in 2007, provides \$31.2 million for development of infrastructure.

With more manure to process, and newer and more efficient gensets, POTB has the potential to improve reliability and increase electricity production from current levels between 150 and 200 kW to levels between 750 kW and 1 megawatt.

A proposed 2010 expansion will increase processed effluent from 3,000 to 5,000 cows, increase electricity production 500 percent above current levels, and result in drier, more fibrous material that POTB can sell at a higher price. POTB's annual revenue from expanded digester activities is expected to jump from its current level of just more than \$400,000 to roughly \$1.5 million per year.

HP Hood LLC

Dave Crowley presents an image that illustrates one benefit of HP Hood's participation in EPA SmartWaySM, a program aligned with the Innovation for U.S. Dairy's E-SMART (Environmentally Sustainable Methods for Achieving Responsible Transportation) project.

Formally launched in 2009, the idea for E-SMART came a year earlier at the dairy industry's inaugural Sustainability Summit. Attendees worked together to identify opportunities to meet the dairy industry's voluntary goal of reducing collective greenhouse gas emissions by 25 percent by 2020.

Crowley volunteered to participate in the E-SMART project because he wanted to contribute to his company's efforts in fuel reduction and cost savings during the 2008 price surge for diesel fuel. E-SMART's primary purpose is to promote the EPA SmartWay initiative – a federal program with the goal of reducing 33 million to 66 million metric tons

of carbon dioxide and up to 200,000 tons of nitrogen oxide annually by 2012. Participating firms have fleets and professional drivers that will accomplish this by reducing their fuel consumption through a variety of improved technologies and smart practices, thereby reducing their greenhouse gas emissions.

As the senior director of environmental health and safety for HP Hood LLC, Crowley uses best practices from the EPA SmartWay program to improve the fuel efficiency of HP Hood's trucks. He encourages other companies to do the same by using aids like electronic onboard recorders and driver scorecards that promote fleet efficiency. Joining EPA SmartWay is free, though companies are responsible for acquiring the suggested equipment and the administrative costs involved with submitting data to the EPA each year.

Both the electronic onboard recording system and driver scorecard tools aid the responsible management of fuel consumption. According



Thanks to the implementation of electronic onboard recorders (EOBRs) and driver scorecards, the burdened chair on the left will soon serve only as the "before" photo, depicting excessive paper usage prior to joining EPA SmartWay.

Lynnfield, Massachusetts

to Crowley, the electronic onboard recording system “enables a carrier to monitor things such as over-speed, RPMs, and miles-per-gallon consumption of fuel – and that translates to a sound method to measure fuel usage.” Crowley offers the adage “What gets measured, gets managed, gets done” to explain how this recording system results in lower greenhouse gas emissions. Driver scorecards record actions taking place within the truck, such as sudden acceleration and deceleration, and idling. By recognizing where fuel is wasted, and how it can be saved, drivers can then focus on correcting those habits.

Crowley credits the driver scorecards with inspiring friendly competition among the employees to see who can get the best scores. “Our drivers have realized a renewed sense of control, and that translates to an increased sense in job pride and contribution,” Crowley says. That positive morale is good for drivers, business and the environment. The corrections made in each truck add up to substantial fuel savings, which saves money and reduces greenhouse gas emissions.

Crowley is excited to be part of a movement that is “creating an expectation for environmentally responsible transportation” within the dairy industry. E-SMART aligns with Crowley’s concern for the environment, but prospective members of EPA SmartWay need not be environmentalists to appreciate the financial benefits of better fuel management. The bottom line, according to Crowley, is the bottom line itself: “E-SMART is primarily pointed toward becoming more efficient with fuel use. You’re saving your company money, and that’s a direct positive impact to the bottom line.”



SMService mark of the U.S. Environmental Protection Agency.

Brooten,
Minnesota

Jer-Lindy Dairy

Jerry and Linda Jennissen's 140-cow herd in Minnesota is industrious, pumping out around 1,100 gallons of milk per day. But that's not the only thing they're producing. The 3,500 gallons of manure Jennissen's animals leave behind turns out to be an asset of comparable value when it is converted into power through an anaerobic digester.

The technology first came to the Jennissen's farm through a grant from the Minnesota Project, a program that encourages sustainable and profitable farming. The project hoped to partner with a midsized to smaller farm to find the technology to make a digester work financially. Digesters have proven effective on farms with more than 300 cows, but approximately 96 percent of Minnesota dairies have between 50 and 200 cows.

"Digester technology is evolving fairly rapidly, and it needs to," Jerry Jennissen says. "We viewed it as an opportunity, and we believe that we can make it work."


By partnering with a nearby processor to add whey to the mix, the Jennissens hope to double gas production.

The digester extracts methane gas from the manure and converts it into power, which is used to run a generator. The electricity is sold on a grid. The remaining solids are separated out and used as bedding, and remaining liquids are used for fertilizer. Jennissen believes it is only a matter of time before technology like this comes to farms of all sizes.

"Things are changing so rapidly. Our digester was the third one in the state of Minnesota," Jennissen says. "There are five now, one year later. I know of several more that are currently operating or in the planning stages."



The digester extracts methane gas from the manure and converts it into power, which is used to run a generator.



Working together, from the farm gate
to the dinner plate.



Next year, Kroger expects at least four manufacturing plants will achieve the goal of sending zero waste to landfills.

The Kroger Co.

The Kroger Co., based in Cincinnati, Ohio, has made environmental and social sustainability not only company priorities, but core values. The company defines sustainability as a commitment to the continuous improvement of its environmental and social impacts in order to support its communities, improve the lives of its customers and associates, and ensure the long-term success of the business. Kroger's sustainability efforts are one example of how the dairy industry is reaching its voluntary greenhouse gas reduction goal in the retail sector of the value chain.

Two of Kroger's initiatives – decreasing energy use and waste reduction – are areas that can greatly impact sustainability in grocery stores. Since 2000, Kroger has reduced energy consumption companywide by more than 27 percent – enough to power every single-family home in Memphis for one year! In 2009, the company recycled more than 1.1 billion pounds of corrugated cardboard, and 22.6 million pounds of plastic.

Kroger also has been working to reduce energy in places where dairy products are often stored – in freezer and refrigerator cases. Kroger has installed light emitting diode (LED) light bars in these cases in more than 1,700 of its nearly 2,500 stores. The company is converting the remaining stores as well. In each store where they are installed, the LED lights can save up to 100,000 kilowatt hours (kWh) or \$10,000 per year.

In addition to energy savings, the LED lights produce less heat, require less maintenance because they are better suited for cold environments, and are not susceptible to rust or corrosion caused by condensation inside the refrigerator and freezer units.

Kroger's manufacturing facilities, including its 17 dairy processing plants, have additional goals of reducing waste and water. Through a variety of initiatives designed to increase recycling, reduce packaging waste and eliminate unnecessary use of natural resources, the manufacturing facilities will cut waste by 50 percent and reduce water usage by 10 percent. Next year, Kroger expects at least four manufacturing plants will achieve the goal of sending zero waste to landfills.

"We consider it a privilege to partner with customers and associates to improve the communities we serve and take meaningful steps to better the environment," says David Dillon, chairman of the board and CEO of The Kroger Co.

As an example of one recent water-saving project, Kroger Manufacturing switched to a new dry technology and saved 1.4 million gallons of water per year. That's the equivalent of 112,000 five-minute showers.

Kroger Manufacturing also has partnered with the International Dairy Foods Association (IDFA) to promote the ENERGY STAR® Challenge. The ENERGY STAR Challenge for Industry is designed to award recognition to only individual sites that achieve a 10 percent reduction in energy intensity within five years.

Kroger understands that energy savings and sustainability matters to customers because the best sustainability programs often reduce costs. Kroger can then use those savings to provide even better prices and services for its customers.

Land O'Lakes

Land O'Lakes is taking action to make sustainability a way of doing business so company projects will routinely be viewed through a sustainability lens. Five "sustainability pillars" define and structure the company's ongoing mission. The Growing Green Team and the Energy Council are two pillars that Land O'Lakes is embracing to make energy reduction and efficiency a top company priority. Current sustainability efforts range from the simple – adding more recycling bins around the corporate offices – to the slightly more scientific – installing submeters at the dairy food processing facilities to monitor the energy consumption of equipment.

Since 2009, in both the company's Shoreview, Minn., and Arden Hills, Minn., office locations, the Land O'Lakes Growing Green Team has introduced a number of initiatives aimed at improving the corporation's environmental carbon footprint. The employees in these two locations engage or take part in a variety of waste-reduction initiatives, including participation in paper-saving contests; taking advantage of improved recycling bins; and using new environmentally friendly restroom products.

Thanks to great participation at the Shoreview facility, in just six months the company has saved \$6,623 by reducing

office paper purchases at the two locations. What's more, the 21 percent reduction in office paper achieved over six months represents more than 1 million sheets of paper, the equivalent of 279 trees. When more revamped recycling bins were added to different locations on various floors, employees showed their enthusiasm by recycling a whopping 40 tons between the two offices. Thanks to the replacement of traditional bathroom supplies with recycled paper products and green-seal-certified soap, Mary Mills Wilson, Land O'Lakes Growing Green Team co-lead, projects an annual savings of \$8,000, as well as a significant reduction in packaging waste.

"All of these savings reflect the spirit of motivation in Land O'Lakes employees," says Tim Makens, director of sustainability for Land O'Lakes. "The team members share a real desire to reduce the overall environmental impact improvement among the staff, and they're pleased for the opportunity to integrate more sustainable habits in their everyday office lives."

Employees are encouraged to submit their recommendations for improving the Growing Green Team initiatives. Makens believes this opportunity to participate empowers and engages staff. The success of these





Saint Paul, Minnesota

initiatives has encouraged the Growing Green Team members to expand those projects to other locations by establishing “green ambassadors” out in the field who support local efforts.

“It’s exciting to do things that are the right thing to do,” Makens adds.

Vic Hammer, director of environmental health and safety for Land O’Lakes, and his team tracked energy use for 10 years before establishing another of the company’s five pillars – the Energy Council. The Energy Council focuses on collaboration to increase efficiency through the implementation of real-time energy use monitoring systems and software designed to track the carbon footprint of overall energy use. These systems will help the council reach its goal of reducing energy use per pound of product by 25 percent in the next 10 years.

They’re already off to a great start. In 2009, thanks to careful energy monitoring, Land O’Lakes dairy food plants across the country reduced their energy consumption by 7 percent.

Working with 10 dairies throughout Land O’Lakes, the Energy Council uses

its monitoring systems to ensure that each piece of dairy equipment is not using more gas than it is designed to utilize, setting off an alarm if the level is exceeded. The installation and upkeep of that equipment is a large investment for Land O’Lakes, a testament to the certainty that energy reduction will continue to be an integral part of the company’s future. Hammer views the Energy Council more as an established component of Land O’Lakes and less as a special project requiring one-time funding.

“I don’t look at it as a project; it’s a way of doing business,” Hammer says. “It’s part of what we do.”

This attitude resonates with Land O’Lakes staff members. Having data to show employees the results of their efforts encourages enthusiasm for their hard work.

“Folks are very eager to share ideas, especially when they can link them back to those tangible results,” Hammer says.

As Land O’Lakes continues to build its sustainability platform, the continued support and collaboration of all its employees is sure to make the organization a leader in the world of sustainable industry.



Leprino Foods

After conducting multiple energy assessments, including Department of Energy (DOE), internal and public utility, Leprino Foods Company, a cheese manufacturer headquartered in Denver, discovered that the biggest opportunities it had to increase energy efficiency were in utilizing waste heat from boilers, transitioning to high-efficiency lighting, reducing refrigeration use, identifying production operation inefficiencies and minimizing clean-in-place (CIP) flows. The energy audit was part of the company's sustainability initiative aimed at reducing its carbon footprint.

Leprino focused first on recycling waste heat and upgrading facility lighting. Through these changes, the manufacturer quickly achieved significant reductions in energy usage, which translated into major savings in operating costs.

Recycling waste heat has proven to be a significant asset to this environmentally conscious manufacturer. At one of its plants, Leprino processes more than 300,000 pounds of milk each hour. By installing a boiler economizer, which captures waste heat from the hot stack and transfers it to a water loop that preheats milk prior to pasteurization, the plant was able to reduce boiler gas consumption by more than 600,000 therms in one year. The total dollar savings was greater than \$500,000.

With changes in lighting, Leprino experienced further financial savings by decreasing energy use. For years the company had used 300 to 450 watt metal halide lamps. Switching to T5 or T8 fluorescent fixtures, however, cut its wattage usage in half and provided identical – if not more – lumens in the same area.

"Regardless of any potential challenges to implementing energy-efficient opportunities, the benefits reach beyond the dollar savings and affect the entire dairy industry," a company representative says.



Switching to T5 or T8 fluorescent fixtures, however, cut its wattage usage in half and provided identical – if not more – lumens in the same area.

Maddox Dairy

California dairy producer Steve Maddox admits to playing favorites. Five-year-old Constance, a 100 percent purebred registered Holstein at the top 2 percent of her breed, holds a special place in Maddox's heart. Not that his appreciation for Constance affects his treatment of the other 4,000 cows at Maddox Dairy. Renowned for its cow care, Maddox Dairy offers its cattle top-notch, sustainably sound treatment. Third-generation producer Maddox is committed to the environmental and economic health of his farm and cows – now and in the future.

In the spring of 2008, the Pacific Gas and Electric Company provided an energy audit and accompanying grant to Maddox Dairy that resulted in substantial energy and cost-savings. Switching to variable speed vacuum pumps alone reduced the dairy's monthly energy bill by 15 percent. In fact, the savings that the vacuum pumps provided were almost identical to the cost of the whole project. In addition to all the money he's saving the dairy, the new pumps have increased the comfort of Maddox's herd thanks to a more consistent vacuum level for the cows being milked.

The cows at Maddox Dairy also have benefited from an improvement in lighting systems. Cows respond well to consistency in all things, including lighting. Replacing 400-watt high-pressure sodium lighting with T5 fluorescent fixtures in the cow shed and free stall areas has provided an energy/cost-savings payback in 1½ years after rebates. And of course, not only does it save energy and money – but it pleases the cows, too. The new fluorescents softened the light, allowing the cows better rest during the night, maintaining consistency while reducing energy consumption by 40 kilowatts.

Given the trying economic times for the country, and dairy producers in particular, Maddox says that every little bit helps to ease the financial burden currently facing Maddox Dairy.

"These new sustainable practices, particularly when they provide better cow care, just make perfectly good business sense," Maddox says of the projects he's already implemented.

But he is not done yet. Though many of the practices he wants to pursue depend on funding that is simply not available at the moment, Maddox is exploring solar panels and new cooling fans, all with his cows' comfort and the farm's environmental and economic well-being in mind. A permit for a methane digester sits on Maddox's desk, waiting for the funding to bring it to life. With a family of three children and 4,000 cows to think of, Maddox has all the incentive in the world to keep on innovating.



Milbank,
South Dakota

Midwest Dairy Institute

For many dairy farms, creating energy from manure is becoming increasingly economically viable. At Midwest Dairy Institute (MDI) of Milbank, S.D., becoming environmentally responsible and sustainability efficient has encouraged good business sense and promised future success.

MDI's 1.7-million-gallon anaerobic digester, operational in January 2006, was built in part as an education project; and educate, it has. Teachings from the digester's implementation – about the strengths and weaknesses of the original design of the digester, its operating capabilities and its future potential – have led to a series of improvements on the process.

The anaerobic digester allows microorganisms to break down organic waste in a process that, in the end, produces methane gas that can be burned just like natural gas. This energy-creating digester produces enough electricity to power the institute's 2,000-cow dairy farm, equivalent to 300 households.

The digester went through maintenance and repairs to get it up to efficient optimizing power. Once up and running, the digester produced not only electricity, but also cow bedding made from the manure solids. At first, all of this production ran smoothly and MDI generated good income from carbon credits sold. Some difficulties with declined gas production and temperature regulation offered the MDI team an opportunity to fine-tune its digester for greater efficiency.

"The digester not only powers our dairy farm, but also helps manage our manure by reducing odor from the manure, allowing us to utilize the liquid byproduct as fertilizer for our fields; and we're able to use the recycled solid as dairy bedding for our cattle," says Howard Manlove, manager of Milbank Community Foundation. "It's a step in the right direction to allow our dairy to become more sustainable and environmentally sensible."



The anaerobic digester produces enough electricity to power the institute's 2,000-cow dairy farm, equivalent to 300 households.

Contributing to healthy diets and a healthy planet.





Installation of approximately 2,500 square feet of solar panels on the roof of its Portland headquarters helps reduce the consumption of heating oil by more than 5,000 gallons per year.

Oakhurst Dairy

Family-owned Oakhurst Dairy is northern New England's largest independent dairy. Based in Portland, Maine, the dairy has a solid tradition of environmental stewardship, expressed in its longtime commitment to "The Natural Goodness of Maine." As one of New England's environmental leaders, Oakhurst has focused in recent years on the effort to reduce greenhouse gases.

Oakhurst was one of the first organizations to sign on to a voluntary State of Maine program in 2004 aimed at cutting greenhouse gas emissions. Under the Governor's Carbon Challenge, Oakhurst set an aggressive goal of reducing carbon by 20 percent by 2010. In 2008, Maine's Department of Environmental Protection and the governor's administration recognized Oakhurst for meeting part of its carbon reduction goal ahead of schedule with a significant 12 percent reduction reported in carbon emissions.

Oakhurst networked with an environmental group to identify resources to help develop and implement a carbon management strategy. The company is finding ways to operate more efficiently, in an increasingly competitive marketplace, with less impact on the environment. In recent years, Oakhurst Dairy has taken dramatic steps to reduce its carbon footprint:

- ▶ **Rerouting software** - Reduces travel time for delivery fleet resulting in saving 88,000 gallons of diesel in the first year
- ▶ **Plant expansion** - Integration of energy-efficient and conservation projects in a multimillion-dollar expansion project that included insulated cold tanks and a hot water recovery system

- ▶ **Transportation** - Conversion to biodiesel fuel for the fleet resulting in reducing more than 1,332 metric tons of CO₂ per year
- ▶ **Solar panels** - Installation of approximately 2,500 square feet of panels on the roof of its Portland headquarters helps reduce the consumption of heating oil by more than 5,000 gallons per year

At Oakhurst, the Bennett family, its employees and the farms that produce the milk are all part of the local community. For that reason, Oakhurst does what it can to give back to the community by donating 10 percent of its profits to organizations that support healthy kids and a healthy environment. In 1993, Oakhurst planted 1,000 trees to restore both shade and beauty to the city of Portland. It is estimated that these trees removed 26,000 pounds of CO₂ from the air and released 13,000 pounds of oxygen into the city of Portland.

Oakhurst isn't going to stop there. Future plans include the possible addition of more solar panels at the headquarters and at the farm level, and identifying ways to reduce methane gas on its farms. Additionally, Oakhurst Chief Operating Officer Bill Bennett is a member of The Carbon Council, which has been leading efforts to design a greenhouse gas "roadmap" for the dairy industry.

Stan Bennett, president of Oakhurst Dairy, says "If it's good for the environment, it's good for business."

O-Rich Dairy

Sometimes the resources needed to be sustainable are in your backyard, but the information you need is across the world.

Tom Oelrichs, his brother, Randy, and his nephew, Russ, are partners in O-Rich Dairy. Tom is a resolution committee member for his district and has served as a member of Dairy Farmers of America, Inc.'s Corporate Resolution Committee for the Central Area. Randy has served as chairman and voting delegate to his area's district annual meeting.

The trio heard that Europeans were using mechanical screw presses to extract oil from oil seeds, and they decided to see if producing their own biofuel from soybeans would work in the United States.

As they conducted their investigation, they came across a video on YouTube® that featured a farmer explaining the process and its benefits. Unfortunately, the farmer was speaking German. As luck would have it, Tom and Randy's father and mother still spoke the language.

So Tom sat his father, Roland, down at the computer and began showing him the video. Roland began translating and Tom, Randy and Russ were sold on the idea of getting a mechanical press. They have soybeans readily available on their 1,200-acre farm, which has been in the family for more than 100 years.

Initially they looked to purchase a mechanical screw press from Europe and have it shipped to the United States. However, it was going to be an expensive proposition to do this, and electronic components would have to be converted to operate here. Fortunately, they were able to find a U.S. company that was beginning to manufacture screw presses.

About 18 months ago, O-Rich Dairy began processing about one-fourth of its soybean crop using the press. The dairy utilizes all the biofuel it produces, which reduces its diesel fuel purchases by about 25 percent. After the oil is extracted from the soybeans, the remaining meal and glycerin parts of the soybeans are fed to the dairy's 120 registered Holstein cows, which means one-fourth of the soybean crop doesn't have to be shipped to market for processing. Plus, since the dairy is able to then feed the soybean meal with the oil extracted, it doesn't have to buy as much and pay the shipping on those feed purchases.

"We also save on transportation because we no longer pay to truck our soybeans to a buyer and truck our meal back to the farm," Tom Oelrichs says.

Right now the dairy only uses the biofuel it produces in the summer months because it can gel up fuel filters in the winter. Still, Tom, Randy and Russ are pleased with their decision to buy the screw press. In fact, the partners at O-Rich Dairy have purchased a second press to capture more fuel savings.



Fort Plains,
New York

Otsquago View Farms

Since 1974, Craig Stevens has been farming on a site that he now owns and operates: Otsquago View Farms in Fort Plains, N.Y. In a given year, Stevens' 120-cow operation produces 1.8 million pounds of milk.

In July 2004, Stevens received a courtesy energy audit from the Montgomery/Schenectady County Dairy Development Energy Program, run by EnSave, Inc., and the New York State Energy Research and Development Authority (NYSERDA). The purpose of the audit was to help Stevens identify energy-saving opportunities, install energy-efficient equipment and reduce the farm's operating costs.

During the 12 months prior to the EnSave energy audit, Otsquago View Farms used about 59,400 kilowatt-hours (kWh) of electricity at an average of \$0.12 per kilowatt-hour, amounting to a total energy cost of about \$7,100. The energy assessment resulted in many recommendations for improving on-farm energy use at Otsquago – with financial commitments ranging from minimal investment to greater capital expense. To achieve maximum efficiency, Stevens chose to install two scroll compressors, a vacuum pump and a variable-speed drive. While this option required a large investment, the lifetime result will deliver significant energy savings.

The adjustments resulted in an immediate reduction in Stevens' energy usage of more than 13,000 kWh annually and a savings of more than \$1,500 in electricity bills. After receiving rebates for the installations totaling more than \$4,100, Stevens expects a return on investment in approximately eight years, and during that time he will have saved enough energy to have operated his farm for nearly two years before the improvements.



To achieve maximum efficiency, Stevens chose to install two scroll compressors, a vacuum pump and a variable-speed drive. While this option required a large investment, the lifetime result will deliver significant energy savings.

Prairie Farms

How does a cooperative started in 1938 remain a prominent player in the dairy industry today? For Prairie Farms, the answer lies in continuously striving for production of a consistently fresh and healthy product; cost savings; and efficiency.

Its efforts to maximize resources and minimize costs have kept Prairie Farms at the forefront of sustainable technology. For example, in the mid-1950s, regenerative heat transfer allowed reductions in the energy required to heat and cool milk for pasteurization. More recently, innovators at Prairie Farms are involved in pilot studies for clean-in-place (CIP) technology, the installation of real-time metering and intervention technology, and the implementation of an energy savings inventory. These pilot studies were launched in conjunction with the dairy industry's voluntary goal to reduce its collective greenhouse gas emissions by 25 percent by the year 2020.

At the industry's Sustainability Summit in 2008, Dave Lattan, vice president of engineering for Prairie Farms, and other participants identified two areas where improvement in thermal treatments would drastically reduce energy usage in dairy processing. The CIP pilot is one of two reduced-temperature treatment projects that were identified at the summit. Prairie Farms offered one of its ice cream production plants as one of six pilot plants to test the new chemical technology that enables much lower temperatures to clean the plant equipment. Preliminary results show this test project has yielded substantial energy savings – about a 40-degree drop required in cleaning the processing lines and equipment – and improved conditions in the truck receiving bay of the plants because the steam reduction has removed the need for rigorous cleaning of mold-prone walls and ceilings.

For Lattan and his colleagues, the new CIP system offers the ability to utilize a technology that will clean equipment at least as well as it's doing now, but with lower energy consumption.

With so many new technologies under way, it is important for Prairie Farms staff to track its progress. Consequently, Prairie Farms is investigating real-time metering at its plants. Plant operators will monitor a dashboard tool that tracks their energy usage in real time. The instantaneous feedback alerts employees if consumption goes beyond the normal limits, so they can intervene to identify the source. This conscientiousness is representative of Prairie Farms' commitment to improving its triple bottom line.

"Doing something that is good for the environment, good for our customers, and good for us is our top priority," Lattan adds.

A recently launched savings inventory project proves just how well Prairie Farms is doing at reaching that triple bottom line already. To quantify Prairie Farms' efforts, CEO Ed Mullins and COO Gary Aggus surveyed all 36 plants to determine the respective projects' savings. So far, 200 projects with positive energy impacts have been identified. Plant operators have implemented a higher amount of the suggested best practices than Prairie Farms executives had anticipated.

Lattan is thrilled to be part of such an impassioned movement.

"I think it's been a pretty exciting ride," he says. "I look forward to being a part of it throughout the rest of my career."



Prairieland Dairy

Dan Rice, co-owner of Prairieland Dairy, milks about 1,500 cows in Firth, Neb.

Prairieland's sustainability philosophy is one of producing zero waste. That means tracking all the outputs from the dairy and making sure each is as sustainable as possible. All of Prairieland's manure is composted and turned into fertilizer. Its compost operation even brings in waste from the town to add to its fertilizer mix.

Under this zero-waste philosophy, Rice says that Prairieland Dairy has been talking about sustainability for quite some time – and he is excited to see the industry focus on the topic. He believes that with greater industry support and efforts, the financial equation will make sustainable practices even more profitable for producers. Rice's sustainability efforts extend all the way to the packaging he uses on his farm. Prairieland milk is packaged in corn-based plastic that can be composted and recycled. This product, along with the fertilizer he makes, are two unconventional outputs of a dairy farm that are completely sustainable.





The digester provides renewable energy for communities, curtails dairy runoff into salmon streams, prevents greenhouse gas (GHG) emissions from entering the atmosphere, reduces landfill and sewage waste, and improves farmers' bottom lines.

Qualco Energy

In Monroe, Wash., a city outside of Seattle, dairy farmers have formed a unique partnership with like-minded organizations to build a community digester. The anaerobic digester is owned and operated by Qualco Energy, a nonprofit partnership made up of the Northwest Chinook Recovery – a nonprofit working to restore and improve salmon habitat; the 3,500-member Native American Tulalip Tribes; and the Sno/Sky Agricultural Alliance – which is directed by five local dairymen and one cattle farmer.

The digester is a viable solution for all the groups involved because it serves multiple goals. It provides renewable energy for communities, curtails dairy runoff into salmon streams, prevents greenhouse gas (GHG) emissions from entering the atmosphere, reduces landfill and sewage waste, and improves farmers' bottom lines.

The Qualco Energy digester has been active since January 2009, a major milestone for the group, which had been working for 10 years to make the community digester happen. After completing the required testing and feasibility studies, the group was able to develop the digester after receiving \$3 million from a federal renewable energy loan, a \$500,000 grant from the U.S. Department of Agriculture (USDA) and the donation of a state-owned dairy farm from the Washington State legislature worth \$1.5 million to \$2 million. To date, the Qualco Energy partner organizations have donated \$500,000 in time and funds.

Project development also was prolonged because of energy price negotiations with area utility companies. In order for the project to be successful, the group would need to profit from the energy they created, says Jay Gordon, executive director of the Washington State Dairy Federation. After many meetings, Qualco Energy reached an agreement with Puget Sound Energy.

"It is a wonderful project, despite its trials and tribulations," Gordon says. "We are still trying

to get some issues resolved, which are also challenges for the rest of the dairy industry."

Qualco Energy's digester is located on the 280-acre site of the former Washington State Reformatory Dairy Farm, which closed in 2002. Qualco Energy has the capacity to digest manure from 2,200 cows. An automatic system flushes concrete alleys from each of the dairy farms every five hours, sending manure from 1,500 dairy cows – nearly 60,000 pounds per day – through underground PVC piping to the site to be transformed into energy.

Approximately 30 percent of materials sent through the digester is feedstocks, a variety of waste materials from nearby farms, restaurants and grocery stores. These feedstocks would normally be placed in a landfill or poured down the drain, but instead are contributing to the majority of the methane gas the digester converts into energy.

The Qualco Energy digester generators produce 450 kWh of power, enough to power approximately 300 homes. Qualco Energy is producing two to three times more gas than the present generator uses and is in the process of expanding its power production with additional generators.

Now that the community digester is active, Qualco Energy hopes to serve as a model for additional anaerobic digester projects, says John Sayre, executive director of Northwest Chinook Recovery.

"We want Qualco Energy to be a public demonstration center for renewable energy, recycling and salmon recovery," Sayre says. "We want people to come here to see what they can do in their communities to benefit air, water, fish and farmland."



DeLancey,
New York

River Haven Farm

As good community members and neighbors, all farmers have to consider runoff and contamination of the local water supply. But when your local water supply happens to provide water for the country's largest metropolitan area, it becomes a bit higher-profile.

River Haven Farm in DeLancey, N.Y., is a 108-head Holstein operation located in the Catskill Mountains. The Catskill/Delaware reservoir systems also are located nearby and provide drinking water for millions of residents of the metro New York City area.

Owner Tom Hutson was one of the first farmers to participate in pilot programs offered by the Watershed Agricultural Council to reduce organic pollution. As such, he's a leader in efforts to develop solutions to watershed protection that retain the farmer's rights to make a living as well as protecting the water supply. Solutions in use on his farm include:

- ▶ Buffer and filter strips – rows of vegetation that slow runoff and erosion, and also filter damaging substances
- ▶ Rotational grazing
- ▶ Forest management for the 57 acres of hardwood forest on the farm
- ▶ Stream restoration

Hutson also protected his farm with a conservation easement, meaning he and future owners of the farm will be able to continue working the land while limiting future development, and preserving the clean water and wildlife habitat for future generations.



Owner Tom Hutson was one of the first farmers to participate in pilot programs offered by the Watershed Agricultural Council to reduce organic pollution.

A man in a green t-shirt and blue trousers is carrying a young boy on his shoulders. The boy is wearing a plaid shirt and blue overalls. They are standing in a lush green field with small white flowers. In the background, there are rolling green hills and distant mountains under a clear sky. The text "Social, economic and environmental responsibility." is overlaid in a light green font across the middle of the image.

Social, economic and environmental responsibility.



Ruan

The story of sustainability need not include radical characters, extreme measures or complicated technology. Sometimes the story of sustainability is simple and intuitive, featuring a practically minded champion.

Jim Mulvenna, senior vice president and general manager of Ruan's Dairy and Bulk Food Transport, recognizes that by the very nature of its business: The transportation industry may never be considered "green." Nevertheless, Ruan is one of many hauling companies looking for ways to increase the efficiency of their distribution systems. Through E-SMART (Environmentally Sustainable Methods for Achieving Responsible Transportation), Mulvenna is helping dairy haulers across the industry to do just that.

Mulvenna serves as co-captain of E-SMART, one of 10 Innovation Center for U.S. Dairy projects aimed at achieving the dairy industry's voluntary goal to reduce greenhouse gas emissions by 25 percent by 2020. Through his work with E-SMART, Mulvenna is a vanguard of improved transportation techniques across the dairy industry. Mulvenna has worked to improve his company's hauling techniques economically and

ecologically with a straightforward approach. Mulvenna offers this simple rule for hauling practices: "Whoever hauls the most, the closest, is going to be the most efficient and cost-effective." Efficiency is achieved by loading more milk onto each truck every run.

Ruan recently reduced a major client's transportation costs by 4 percent by rerouting more than 80 percent of its milk to travel less than 10 miles to its destination.

Improving milk delivery processes is an investment in the future. The dairy hauling industry has not undergone significant reforms in more than 50 years. Given the current economic challenges for dairy producers, improving the environmental impact of their milk's journey from farm to plant may seem less important than ever. But Ruan points out that implementing more efficient distribution practices also will save dairy producers money. As Mulvenna describes it, "Driving efficiency in our industry will have both economic and environmental benefits. You take more trucks off the road, drive fewer miles, and you're going to save money and reduce your impact on the environment."

When forward-thinking dairy producers are willing to modify some practices, Ruan is ready to make them another of the company's many success stories. Mulvenna explains, "In order to have the most efficient transportation system, we may have to change a few things that have been in place for years. We have to provide customers with economies of scale, haul bigger volumes." One of the easiest opportunities to reduce carbon footprint and transportation costs is efficient routing. Ruan recently reduced a major client's transportation costs by 4 percent by rerouting more than 80 percent of its milk to travel less than 10 miles to its destination.

Whether decreasing idling time at dairy farms or modifying a milk pump's power level, Mulvenna and his colleagues at Ruan are improving the dairy industry one haul at a time. Beyond the standard driver improvement techniques, through E-SMART Mulvenna works with dairy producers to improve their overall distribution system. When Mulvenna meets prospective customers, he does not begin with praises of the sustainability movement. He says instead, "There are better ways to do this than we're currently doing it." Those better ways can save money and energy.

Stonyfield Farm

For two decades, Stonyfield Farm in Londonderry, N.H., has been actively involved in reducing its impact on the environment, a goal not distant from the company's roots as a farming school focused on sustainable agriculture. Stonyfield began measuring its carbon footprint in the 1990s and took steps to reduce energy use in its "Yogurt Works" processing facility. Now, the largest organic yogurt company is finding sustainable success across its own supply chain.

Between 1995 and 2005, Stonyfield Farm reduced its facility's energy use and the associated CO₂ emissions per pound of product by one-third through the implementation of multiple energy-efficiency measures. Stonyfield

Farm has saved more than \$1.7 million and 46 million kWh — enough energy to power 4,500 homes for one year. Every year since 1997, Stonyfield has offset 100 percent of its facility's energy emissions by investing in wind energy, farm methane recovery and reforestation.

Gary Hirshberg, president and "CE-Yo" of Stonyfield Farm, believes that sustainable practices are profitable, and continues to search for innovative ways to create a high-quality product without burdening the planet.

"A founding principle of our company is commitment to responsible environmental stewardship and to the development of a sustainable agricultural system," Hirshberg says.

Every year since 1997, Stonyfield has offset 100 percent of its facility's energy emissions by investing in wind energy, farm methane recovery and reforestation.

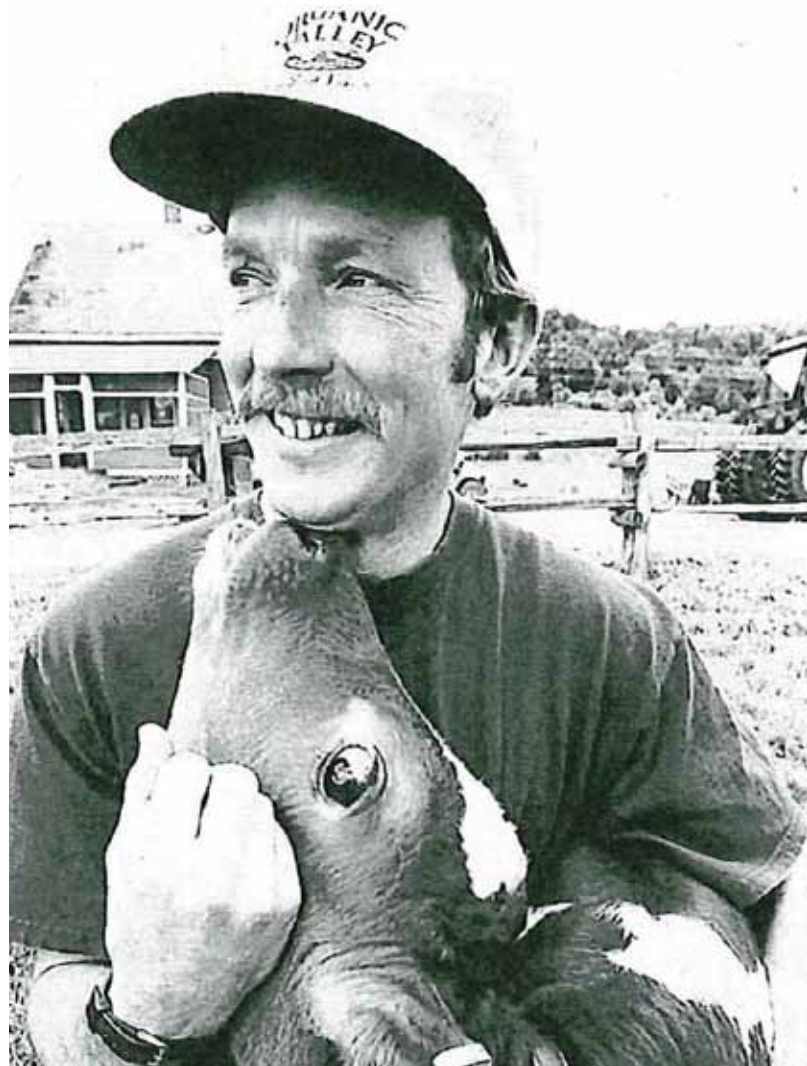


Londonderry, New Hampshire

After minimizing solid waste, conserving energy and utilizing environmentally friendly packaging in its own operations, Stonyfield turned its attention to the largest portion of its carbon footprint – milk production.

In 2008, Stonyfield Farm launched the Greener Cow pilot program with 15 Vermont Organic Valley farms that supply milk for Stonyfield's yogurts. By feeding cows a diet high in natural omega-3 sources – such as alfalfa, flax and grasses – farms decreased enteric emissions by an average of 12 percent, and in some cases as much as 18 percent. They also found that the program improved the nutritional value of the milk by increasing the milk's omega-3 content and decreasing the level of saturated fats.

"We are proud to be involved in many projects and innovations that have a positive social and environmental impact," Hirshberg says. "After all, healthy food can only come from a healthy planet."



Tetra Pak Inc.

Tetra Pak Inc., in Vernon Hills, Ill., has sustainability in its DNA. Its mission states that the company believes in responsible industry leadership, creating profitable growth in harmony with environmental sustainability and good corporate citizenship.

Tetra Pak demonstrates this belief in a variety of product innovations. The multinational food processing and packaging company's new filling machines are energy- and water-efficient, certified by the Environmental Product Declaration. And its new ultra high temperature (UHT) processing system for dairy reduces product waste, as well as usage of water, energy and chemicals.

Responsible forestry, recycling and carbon footprint reduction are focal points for Tetra Pak. In 1996, Tetra Pak received the Presidential Award from the U.S. Council on Sustainable Development for aseptic (nonrefrigerated) packaging, which is the only package type to ever receive this award.

In addition to its packaging, Tetra Pak strives for environmental responsibility in other ways:

- ▶ **Renew** – Tetra Pak nonrefrigerated cartons are on average made from 70 percent paper. Chilled gable-top cartons are an average of 85 percent paper. One hundred percent of the paper used for Tetra Pak cartons is from responsibly sourced, well-managed forests, where new trees replace those harvested, all while removing CO₂ from the atmosphere.
- ▶ **Reduce** – Tetra Pak sets goals both locally and globally to continually improve its development, sourcing, manufacturing and transportation activities. One goal is the company's commitment to reduce its worldwide CO₂ emissions by 10 percent by 2010. In the United States, a Tetra Pak plant in Denton, Texas, has reduced its energy consumption by 27 percent since 2002.
- ▶ **Recycle** – Tetra Pak has facilitated carton recycling in the packaging industry since 1990. To date, more than 60 million U.S. residents have access to carton recycling (www.recyclecartons.com). To improve the carton recycling infrastructure in the U.S., Tetra Pak helped form the Carton Council in 2009. Through collaboration with local municipalities and the council, Tetra Pak aims to address challenges by promoting recycling technology and local collection programs, ultimately limiting the number of cartons that become waste.

Tetra Pak Inc.'s mission states that the company believes in responsible industry leadership, creating profitable growth in harmony with environmental sustainability and good corporate citizenship.



United Dairymen Of Arizona

The United Dairymen of Arizona (UDA) dairy cooperative's modern manufacturing facility in Tempe, Ariz., operates 24 hours per day, seven days per week. It produces high-, medium- and low-heat nonfat dry milk; milk protein concentration; cream; butter; skim milk; condensed skim milk; and lactose powder. UDA's plant has the capacity to process 10 million pounds of milk per day. Recognizing the growing importance of improving sustainable production and processing practices, the cooperative developed a plan to help its 70 members increase energy efficiency and lower energy expenditures.

"Through a series of updates, we have cut our energy use in half and are reducing our impact on the environment at the same time," says Anson White, UDA's vice president of human resources. "Becoming more sustainable is helping our bottom line, which is important during these tough economic times."

Looking at every step in the value chain, UDA evaluated current energy use and identified new methods to improve processing efficiency. Through the implementation of several new practices and technologies, the cooperative cut its annual electricity use nearly in half – energy costs went from \$480,000 in 2006 to \$248,000 in 2009. The implementation of a combustion catalyst system in UDA's fleet has provided an annual fuel savings of almost 100,000 gallons, translating to a combined total dollar savings of \$480,000 since 2008.

Additional implementations, including ammonia controls, ultrafiltration, high-efficiency motors, compressed air conservation, and economizer boilers, are under way that will provide energy- and cost-saving returns within three months to four years. Combined, these projects could save UDA more than \$1 million annually.

Short-term projects (three months to one year) will show potential energy conservation of 7.8 million kW and 184,154 therms, and potential annual savings of \$795,553. Long-term projects (one to four years) will show potential energy conservation of 3.6 million kW and 60,680 therms, and potential annual savings of \$330,350.

A longer-term and more costly project is UDA's plan to replace electricity with natural gas through combined heat and power gas drive turbine generators. This project has an estimated implementation cost of \$7.6 million, with a potential savings of \$3.1 million per year. That's a simple payback of about 2½ years.



These projects could save UDA more than \$1 million annually.



Van Ess Dairy, LLC

The Van Ess family follows a detailed management plan to be sure it runs its Iowa farm well. To ensure freshness, Van Ess Dairy milk goes through a chiller and is loaded directly into tankers. From there it is hauled to Associated Milk Producers, Inc., just a few miles away in Sanborn, Iowa. To keep its animals comfortable, Van Ess Dairy uses recycled sand bedding. It also built a cross-ventilated barn with fans and a cooling wall that together can decrease barn temperature between 10 and 15 degrees in warmer months.

"It's not about the size of the dairy, it's about doing a good job with cows," Harvey Van Ess says. "Our highest goal is simply to be very good dairymen. We want to take great care of our animals, and treat our neighbors with respect."

Van Ess' parents immigrated to America in 1948 and began a dairy farm. Harvey and his wife, Lisa, took over in 1986 and slowly began to grow the herd. In 1994, the family moved to Idaho and bought an existing dairy, increasing it to 500 cows. After 14 years there, a second dairy had been purchased, and the family was ready to move to a better location for its cattle. On Feb. 3, 2008, the Iowa farm produced its first gallons of milk.

"We're proud to provide a safe and wholesome product to consumers," says Lisa Van Ess. "As a family, we're thankful for new technology and for the freedom and opportunity to own dairy cows here in Iowa."





Baldwin,
Wisconsin

Vrieze Farms

John Vrieze used to spend thousands of dollars each year just on hauling the manure from his 3,200 cows out to holding ponds. Now, instead of hauling the manure, Vrieze, owner of Vrieze Farms in Baldwin, Wis., drinks it.

Thanks to a sustainable nutrient management system called NuWay™, developed by Integrated Separation Solutions, LLC, in Madison, Wis., Vrieze and many other dairy farmers can mechanically break down cow manure into reusable elements.

Vrieze takes his cow manure – which is 90 percent water – extracts the nutrients and turns the rest of the waste into clean, clear, drinkable water. He uses the waste's nitrogen

and methane for energy, and fertilizer and bedding for his cows. The rest is turned into distilled water.

The water is clean and safe to return to the watershed, Vrieze says, and he recently received a Wisconsin Department of Natural Resources permit to use the recycled water on his fields. In the meantime, Vrieze and his cows enjoy drinking it.

"The dairy industry needs to change the way we handle liquid manure," Vrieze says. "This is the biggest change I've ever seen in my life and it will really impact the industry."



John Vrieze uses the waste's nitrogen and methane for energy, and fertilizer and bedding for his cows.

High-quality, wholesome foods and ingredients.





Walmart

Since the launch of its sustainability initiative in 2005, Walmart has continued to make measurable progress toward becoming a more environmentally friendly company. The effort, which is referred to as “Sustainability 360,” is a companywide emphasis on integrating sustainability into Walmart’s business by engaging associates, suppliers, communities and customers.

“Now, more than ever, the Walmart family understands that we have a responsibility and an opportunity to make a difference with sustainability,” said Michael Duke, president and chief executive officer, in the Walmart 2009 Sustainability Report.

One way Walmart is engaging suppliers is through the worldwide sustainability index initiative, which was launched with the customer in mind. Duke says, Walmart’s customers want products that are more efficient, last longer and perform better. Customers also want to know the product’s entire life cycle, that the materials in the product are safe, and that it was made well and produced in a responsible way.

The index is being introduced in three phases:

Supplier assessment – In July 2009, Walmart announced it would provide its more than 100,000 global suppliers with a brief survey to evaluate their own companies’ sustainability. The questions focus on four areas: energy and climate; material efficiency; natural resources; and people and community. As of the end of October 2009, the vast majority of Walmart’s top-tier suppliers had responded to the 15-question survey. Because of the dairy industry’s voluntary efforts in measuring its carbon footprint, many dairy suppliers were well-prepared to respond to Walmart’s request.

Life cycle assessment database – Walmart is helping to create a consortium of universities to collaborate with suppliers, retailers, nongovernment organizations and government officials that help develop a global database of information on products’ life cycles – from raw materials to disposal. Walmart provided initial funding for the Sustainability Consortium, which will be jointly administered by Arizona State University and the University of Arkansas.

The Super Sandwich Bale allows Walmart to process 32 recyclable items, including plastic shopping bags, aluminum cans, plastic hangers, plastic water and soda bottles, office paper, paperback books and other recyclable items, by pressing these commodities between two stacks of cardboard and bundling it for transportation.

A simple tool for customers – The final step of the index is to provide customers with product information in a simple, convenient, easy-to-understand manner so they can make choices and consume in a more sustainable way. This will provide customers with greater transparency into the quality and history of products than they have today. How that information will be delivered to consumers is still undetermined.

Walmart is working closely with the dairy industry on sustainability efforts. Check out the *Secret Life of Sour Cream* video and other tools and information available on Walmart’s sustainability website, Walmartstores.com/Sustainability/.

“At Walmart, we see sustainability as one of the most important opportunities for both the future of our business and the future of our world,” says Matt Kistler, senior vice president of sustainability at Walmart.

Wolfden Dairy

After brothers Dan and Steve Wolfe of Wolfden Dairy relocated their dairy operation to central Nebraska and a county with a nearly nonexistent 4-H dairy program, they created the 4-H Lease-A-Calf Program. Dan and Steve wanted to encourage their children's continued involvement in and introduce other young people to the dairy industry. The program provides young people with a valuable learning experience and an appreciation of farming, whether or not they end up in an agricultural career.

Through the Wolfes' Lease-A-Calf Program, participants select a 2-month-old calf from Wolfden Dairy. The dairy helps cover the costs of raising each calf, but the children are responsible for taking the calf home and providing food and healthcare needs. The program culminates at the Buffalo County and Nebraska State fairs, where all participants exhibit their calves. Once the show season ends, the calves are brought back to the dairy.

The Lease-A-Calf Program now boasts 23 members. These young participants enjoy the hands-on responsibility, education and team-building aspects of their experience.

"In rural America, kids don't have the contact with animals they once did," says Dan Wolfe. "Creating a 4-H dairy program has helped us try to fill this gap in our county."



The program provides young people with a valuable learning experience and an appreciation of farming, whether or not they end up in an agricultural career.



Hockessin,
Delaware

Woodside Farm Creamery

Woodside Farm Creamery operates very differently from when it was founded in 1796. Instead of horse-generated energy, the farm now harvests and recycles natural resources like the sun, water and fertile soil to produce high-quality milk and ice cream.

"By providing our cows with a comfortable environment and a nutritious diet, they supply us with high-quality milk, rich in butterfat, which we use to make our ice cream," says Jim Mitchell, owner and operator. Thirty-two Jersey cows produce the rich milk used to make the more than 35 ice cream flavors available at the creamery.

Mitchell works diligently with the Natural Resource Conservation Service to find the best practices to conserve natural resources on the farm. Cover crops keep the topsoil intact over the harsh winter, while manure is recycled on fields as fertilizer, putting nutrients back into the soil. Woodside Farm uses water to cool the ice cream machines, which is then recycled to several other places around the farm.

All cardboard and bottles are recycled at the county recycling center. The on-farm composter is loaded with biodegradable material, like the paper cups and ice cream containers used at the creamery.

"The single largest expense for our business is electricity, mainly for the freezers," Mitchell says. Operating the ice cream stand alone requires 10 freezer units. The main ice cream freezer at the dairy measures 12 feet by 30 feet and is kept at a chilly 15 below zero.

So, the Mitchells put in a solar panel system – one of the largest in the state of Delaware. Eighty-five percent of the operation's power needs, including homes, barns and the creamery, are harnessed by 570 solar panels located in the pasture. An odd attraction to say the least, but the system is an impressive innovation from just one family dairy farm conscious about sustainability.



Innovation Center for U.S. Dairy™ provides a forum for the dairy industry to work together pre-competitively to address barriers and opportunities to foster innovation and increase sales. The Innovation Center aligns the collective resources of the industry to offer consumers nutritious dairy products and ingredients, and promote the health of people, communities, the planet and the industry. The Board of Directors for the Innovation Center represents leaders of more than 30 key U.S. producer organizations, dairy cooperatives, processors, manufacturers and brands. The Innovation Center is supported and staffed by Dairy Management Inc.™

To submit your sustainability story, please contact the Innovation Center at innovationcenter@usdairy.com.
www.USDairy.com/Sustainability

