Green Living PRESS

# Sustainable Dairy: Moo-ving Forward

By Brendan Pringle – June 5, 2012

Some of the greenest dairy farms exist in California. Could this be why our cows are so happy? Perhaps.

But throughout the nation, dairy is one of the greenest sectors of the agricultural industry.

While farmers will likely "milk" this out for all it's worth in our "sustainable age," the facts simply don't lie.

According to the Innovation Center for US Dairy, "greenhouse gas (GHG) emissions for the dairy industry make up only about 2 percent of total US emissions," and the industry has reduced its carbon footprint by more than 63 percent since 1944.

Farms tend to be handed down from generation to generation within the family and thus sustainability is an integral component of how they do business.

**1) Reducing Emissions 'Til the Cows Come Home**
The California dairy industry has reduced its air emissions by about 28 percent over the past six years, and part of this has emerged from a greater attention to VOCs. Volatile organic compounds (or VOCs for short) are an issue that affects just about every industry when it comes to sustainability.

According to James Garner of Dairy Cares, a statewide coalition of dairy farmers working on sustainability issues, fermentation of silage is the largest source of VOCs on dairy farms. Farmers have recognized this environmental issue, and have limited emissions through several common sense techniques. These include keeping a smooth face on the silage pile, as well as keeping the silage in feed bags.

**2) Letting "It" Flow: The Importance of Water Management**
Dairy farmers not only "cry over spilled milk"; they are very sensitive about water. As Dante Migliazzo, a dairy farmer from Atwater, CA notes, "We recycle everything from our water to our dirt. Everything is done in proper balance."

Clean water is used to cool the milk and wash the cows. However, water is constantly recycled around the farm in a way that is both sustainable and scientific.

When cows do their "business" in their respective stalls, their manure is flushed from the barn floors with recycled water and collected in a pond. This "nutrient water" is then used to irrigate crops. As such, dairy farmers are able to avoid the use of synthetic and chemical fertilizers.

The process is actually a bit more complex and scientific than it sounds. Farms in the California Central Valley abide by a "nutrient management plan" which determines the ideal combination of manure and water for the soil. At the same time, they keep an eye out for groundwater resources.

Ray Gene Veldhuis, owner of RV Dairy in Cressey, CA, has been (literally) digging beneath the surface to discover the mysteries of efficient nutrient use. After taking several samples, he has come to realize that commercial fertilizers were virtually unnecessary "when nutrient water was applied agronomically."

**3) Producing More Than Just Milk**

It may be one of its stinkier elements, but cow manure has the potential to revolutionize the dairy industry. Manure releases harmful methane gas into the atmosphere. Thanks to the innovation of methane digesters, dairy scientists have seen the light…even if they've had to squint a bit in the process.

The process is simple: cow manure is placed into a containment lagoon where a natural microbial process converts the "stuff" into methane. The methane gas is then treated and used to fuel a generator. Jon and Tami Tollenaar's dairy farm in Elk Grove has actually been able to produce 1.5 million kilowatt-hours annually as a result of their methane digester system. That's enough to power approximately 180 homes.

Unfortunately, this form of technology requires a heavy capital investment, and thus its popularity hasn't quite "taken off." Likewise, they use natural gas engines, which still generate NOx emissions. Research efforts are as aggressive as ever and are happening right on the farms.

RV Dairy has been a leader in researching other methods of deriving energy from manure. As he comments, "Current methane digesters are doing the right thing, but I'm looking for something better." The goal of his work is to convert the manure into a sludge form that could subsequently be converted into an energy source (either biodiesel or natural gas). As Veldhuis explains, this could potentially develop into a whole new industry.

Several dairies throughout the state and nation have likewise decided to generate their own power and have installed solar panels throughout their farms. The results have been phenomenal. Garner says that these panels often power "around 85-90% of their needs."

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As dairy farmers throughout California and the nation become more and more familiar with developing technology, they will continue to set the bar for the entire agricultural industry.

The results are bound to be "udderly" marvelous.

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