

Dairy Manager's Annual Report of Holsum Dairy's Third Year of Green Tier Qualification

I will start by repeating a 2007 success: all the hard work of the past years led to our being the first dairy in the country to pass an ISO 14001:2007 conformance assessment. Being the 'first' is not, and has not been, a goal of ours. However, it is relevant in at least two contexts:

1- Wisconsin's Dairy Business Association (DBA), in the final months of 2007, reached agreement with WDNR to maintain a database of environmental legal requirements specific to dairy farming. Green Tier and ISO14001 mandate keeping abreast of current federal, state, and local governmental directives.

2- The DBA-Green Tier Charter agreement was predicated on at least one Wisconsin dairy's passing the ISO 14001 assessment, so this success opened the door for fellow DBA members to consider Green Tier qualification. The database is a big step in removing legal surveillance responsibility from the individual participants.

In 2008, Holsum Dairy continued conversations with interested businesses about innovative projects such as:

- recycling of manure fiber into particle board
- capturing flared landfill methane gas for a productive purpose
- acquiring higher efficiency manure fiber separators to reduce fossil fuel use during application

Also in 2008, we reinvested in our business in the form of two more barns on the Elm Dairy site: one for nursing calves and one for calves that are weaned and too young to go to off site 'heifer grower' specialists.

A test project was conducted on utilizing paunch manure from a rendering plant in the manure digesters. Results were positive for renewable electrical production and improved nutrient management. However, additional investment was required to make the system work properly and the paunch manure provider was unable to make a long term commitment.

Holsum-Irish Dairy had several generator engine problems which resulted in little to no electrical production for several months. The system is currently running well and 2 new gensets with an increased efficiency from 26% to 36% are being considered to replace the old units.

Eave troughs were installed at Holsum-Irish Dairy to prevent rain water from being mixed in with feed and to contribute to storm water management efforts. The drier work area adds to worker safety and comfort, too.

Haylage and corn silage pile covering lessons: silage covering at both dairies went extremely well. Rapid/timely covering has resulted in minimal visually detectable spoilage on the surface of the corn silage and haylage. Density determinations for both crops indicated excellent compaction was achieved. All in all, fewer odors, less wasted feed, and higher quality forage resulted from these efforts.

Consequently, we reduced agricultural plastic usage more than 50% for the haylage feed. This means only half as much plastic is sent to the landfill from that crop. In addition we will evaluate the use of a second layer of **reusable** plastic to determine if we can halve our plastic use for haylage and corn silage in 2010.

One of the cornerstones of the Green Tier program is changing the relationship between the DNR and participating companies. We continue to participate in Green Tier Dairy Charter discussions, host various DNR groups, and meet with DNR through the Professional Dairy Producers of Wisconsin public advisory committee.

Respectfully,

Kenn Buelow, Dairy Manager, Holsum Dairies, Hilbert, Wisconsin 54129

Regulated topics:

Manure Metrics

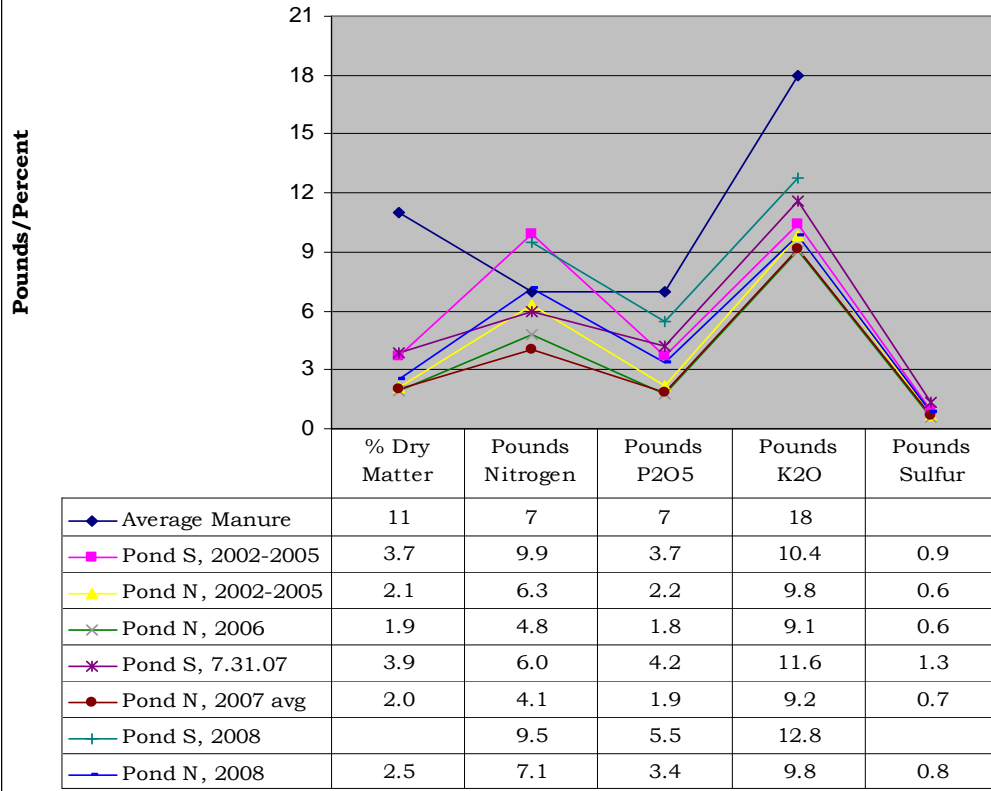
Manure composition is of interest to us for our nutrient management plan, as well as for minimizing our environmental footprint. After capturing the energy and fibrous material from cow "waste", we have effluent with 82% less dry matter, 32% less nitrogen, 75% less phosphorous pentoxide (44% phosphorus), and 49% less potassium oxide (83% potassium); when compared to undigested manure values.

-In 2008, of approximately _67_ million gallons, only 25 % was spread by tanker trucks or tractor-towed wagons. (Elm Dairy cannot be 100% liquid application because of the west settling pond. It needs to be trucked to designated fields.)

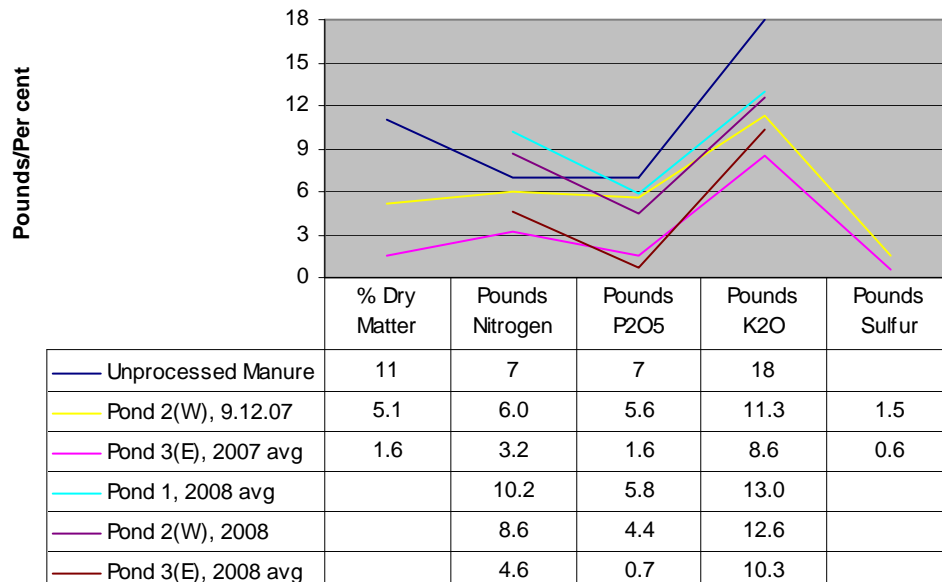
2005 gallons applied:	29,599,495	(Irish Dairy)
2006 gallons applied:	46,040,343	(Irish Dairy and start of Elm Dairy)
2007 gallons applied	>67 million	(Irish and Elm Dairies)
2008 gallons applied:	>100 million	(Irish and Elm Dairies)

We have placed a down payment on an irrigation pivot for Elm for 2009 and are in the running for funding for additional separation systems to capture nutrients and reduce the absolute and percentage of nutrients applied by the irrigation system. At the same time, this allows for an increase volume of manure liquids to stimulate a growing crop and balance its nutrients.

Manure Analysis, Holsum Irish Dairy



Manure Analysis, Holsum Elm Dairy



Reminder of what all those digested manure numbers mean:

-Less phosphorus builds up in the soil, no longer available to run into streams and contribute to algae bloom.
-We provide nitrogen and potassium (potash) and water to the alfalfa crop. By applying effluent when the soil is relatively dry, and the plant is actively growing, we reduce the likelihood of nitrogen leaching through the root zone. We reduce the purchase, transport and additional application of fertilizer.

Water usage

We are tracking our **water usage** from each well, as required by statute. In addition, to allow for retrospective data mining and managing, we are comparing it to the numbers of cows (milking and dry) and the amount of milk shipped from the dairies. Increased water usage in hot months is for cow cooling primarily. Water conservation has been in place for five years.

University of Wisconsin Extension reports an average of 40-45 gallons per day per cow for the average dairy farm. This includes not only the water they drink, but all water used to wash facilities, milk storage tanks, milking machines, and water to cool the milk and the cows. For 2008, our Elm Dairy averaged 37* gallons per cow per day, and Irish Dairy averaged 33*. It appears the increased usage at Elm Dairy occurred mainly during the summer months. Our current interpretation is that the sprinklers for cooling cows are turned on too long. We will be reducing the 'sprinkler on' time and evaluate the impact on water usage.

*By way of comparison, Wisconsin D-N-R Bureau Chief Jill Jonas, on Wisconsin Public Radio May 5, 09, noted that the average Wisconsin human uses 63 gallons each day, about 18 gallons of which is toilet flushing. In arid states, she reported that per capita usage is over 100 gallons a day.

EMS Internal Audit Summary, September 3, 2008

Auditors: Liz Doornink and Sara Kreft of Jon-De Farms in Baldwin, WI.

Summary: The auditors were on-site, visited both Irish and Elm facilities, spoke to employees, questioned protocols and procedures, and found nine minor nonconformances.

LD9/3/08-01 and -03 were minor revisions to procedural documents to reflect more accurately our routines and practices. They were corrected the next day.

LD9/3/08-02, -04, -05, -06, -07, -08, and -09 related to missing or inaccurate written protocols for the fire extinguisher maintenance schedule, the recycling protocol for office waste, an oil recycling directive on the shop wall, emergency drill training, first aid kit inventorying, Material Data Safety Sheet review procedure, and ongoing vendor notification of our involvement in Green Tier.

We are grateful for the discoveries. The necessary corrective actions have resulted in our improving our preventive environmental performance.

Protocols were developed and refined over the next months. They were presented to management and reviewed, per ISO 14001.

Corrected Environmental Errors:

Liquid manure spills, chronological order	2006	2007	2008
August 2006, Severity 0	1	2	1
September 2007, Severity 1			
December 2007, Severity 1			
June 2008, Severity 1**			
0 == no impact on surface or ground water			
1 ==reached adjacent on-dairy dry containment ditch			
2==reached sediment retention ponds			
3== reached surface water (stream/pond/lake)			
4==impacted ground water			

**A spill was quickly discovered, the on farm containment area was 'vacuumed' and rinsed, and vacuumed again. The net effect was compared to, at most, two bags of lawn fertilizer. Remediation was documented and filed on time.

By comparison, the Milwaukee Journal Sentinel, November 30, 2006, reported that "since 1994, Milwaukee Metropolitan Sewage District has dumped an average of more than 1 billion gallons of untreated sewage per year into Lake Michigan."

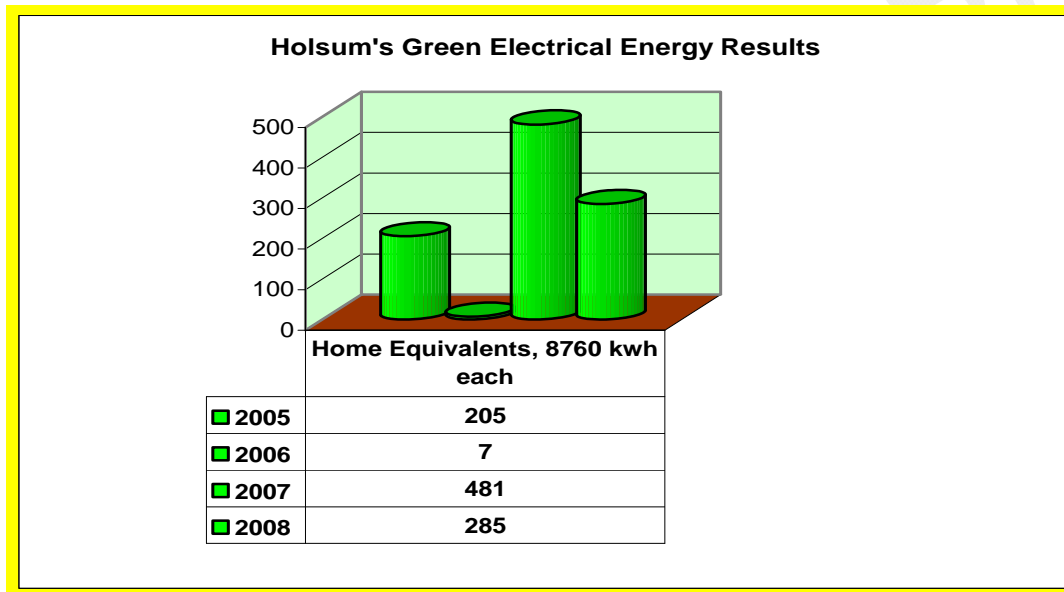
We do not elevate our record by criticizing Milwaukee. Rather, the reference is included for perspective on the often sensationalized agricultural contribution to environmental pollution. Holsum Dairies, LLC remains committed to bettering our environmental performance. And we encourage all progress made by the Milwaukee Metropolitan Sewage District and other current Great Lakes polluters.

Unregulated topics:

1-Energy Producing Manure Digesters

Kilowatt Hours balance data: Holsum-Irish Dairy had several generator engine problems which resulted in little to no electrical production for several months. The system is currently running well.

Year	Irish Gen, kwh	Irish Use, kwh	Irish Excess, kwh	Elm Gen, kwh	Elm Use, kwh	Elm Excess, kwh	Combined Excess, kwh	Home Equivalents, 8760 kwh each
2005	4,149,991	2,352,707	1,797,284	-----	-----	-----	1,797,284	205
2006	2,246,260	2,183,638	62,622	-----	268,680	0	62,622	7
2007	3,339,093	2,734,106	604,987	6,120,919	2,514,400	3,606,519	4,211,506	481
2008	1,503,829	2,353,664	-849,835	5,921,935	2,578,818	3,343,118	2,493,283	285



WPSsummaryKWHdata.xl

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2-Fuel Usage in gallons:

	2005	2006	2007	2008
Diesel, Irish	55,270	62,117	58,536	63,698
Diesel, Elm	-	-	53,484	71,079
Gasoline, Irish	2,566	2,964	2,752	2,923
Gasoline, Elm	-	-	5,537	4,752
Propane, Irish			23,251	30,883
Propane, Elm			18,007	19,452
Fuel Oil, Irish			-	16,281

Dairy update:

2008 construction of a nursery barn and a weaned calf barn at Elm Dairy: During the hectic periods of design (in which a novel approach to housing developed) and construction, which is always time consuming, the Green Tier ideal of advance training of staff did not occur. The calf raising system incorporates new ways of feeding and housing calves; additionally, we are still changing the machinery and processes as we team up to meet each challenge. In this sense, we are all learning together.

An External Communication:

From Dairy Herd Management, October 2008:

These two dairies house a combined 6,900 milking cows. Two digesters are used on each dairy to manage manure. Both use a modified plug-and-flow digester. Holsum Irish Dairy's digester has been operating for six years and Holsum Elm Dairy's digester has been operating for two years.

"We originally installed the digesters to control odor and provide energy," says Kenn Buelow, DVM, MS, co-owner of the dairies. "The plan was to break even on our investment. But, since installing the digesters, we have been able to increase revenues and reduce our cost."

In fact, Buelow says, "Everything we've done environmentally has made us money."

The digesters produce more energy than the dairies can utilize. Excess energy is sold back to the utility company. But the digesters produce more than just energy. Solids from the digester are used as bedding for both dairies, saving approximately \$360,000 each year in bedding cost. In addition, separated solids are sold for bedding to other dairies at \$15 per ton.

Liquids from the lagoons are utilized as fertilizer by the 40 farmers who grow feed for the dairies. The liquids are 3 to 4 percent solids, and are transported via surface hose or dragline to the cropland; 20 percent is trucked. The cropping agreements include arrangements to use the liquids from the lagoon.

Buelow has also found that between the digesters and separation process, the phosphorus level in the lagoon water has decreased. There are approximately 1 to 2 pounds of phosphorus for every 1,000 gallons of lagoon water. "This is not something we expected, but it definitely works to our benefit," Buelow says.

The dairies can't make enough manure to meet their demand for fertilizer. To increase the nutrient content, food-processing waste, malt ingredients and slaughter-cow waste is brought in. These businesses are charged a tipping fee to deliver them to the dairy.

Buelow continues to look for the highest value for his manure. Currently, he is looking at pelleting the solids for wood-burning stoves. He is also working with a forage-products lab to make particle board and plastic piping from the solids.

"The options, usage and market for manure will only continue to grow," he says. DHM

[Thanks to Dairy Herd Management print and online magazines for this article.](#)