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*For more information, or
questions about how to
proceed with efficiency
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Energy Efficient Farms: Dairies

Because of the large number of technologies involved in running a successful dairy operation, dairies are one of the most energy intensive farm industries. Fortunately, researchers have conducted a large amount of work toward developing technologies and practices that can make dairies more energy efficient. Dairymen can reap the benefits. Some energy saving techniques

require no monetary investment. Other technological upgrades can pay for themselves in as little as one to three years. By determining which dairy operations are the most energy intensive, dairymen can make targeted improvements and upgrades to start saving significant revenues right away.

Additional Facts:

- Energy costs account for about 10% of a typical farm's budget, according to the Institute for Energy and the Environment.
- The average U.S. dairy farm uses 800-1,200 kilowatt-hours of electricity per cow, annually.
- Milk production equipment uses between 50% and 70% of a dairy farm's energy consumption, while lighting, ventilation, and other incidentals account for the rest.
- Efficiency improvements made to milking equipment can cut overall electricity costs by as much as 50%.

Utility Rebates

Average utility rebates for Energy Efficient Dairy Production Technologies:

Lighting:

Higher rebates for retrofits/replacements: \$2-6 per bulb (\$10-50 for fixtures), or 3-10 cents per watt saved

Dairy Cooling Plates:

Varies, but up to \$500-\$1,400 based on herd size (~\$3 per cow)

Variable Speed Drive:

~\$35/hp

Low Cost Improvements/ Preventative Maintenance

Decrease compressor pressure to the minimum amount needed to save 10% on energy costs per 20 lbs. reduced.

Conserve water and reduce water heater temperatures to the minimum needed; each 10° F decrease can mean a 3-5% decrease in energy costs.

Clean heat exchanger and condenser coils, at least quarterly, to save 3-5% on milk cooling costs.

Check for air leaks in vacuum systems, which can cost in energy loss, slow down milking times, and lead to poor udder health.

Energy Efficient Technology Upgrades

Scroll Compressors: With fewer moving parts than reciprocating compressors and no intake or discharge valves, scroll compressors are a quieter, longer-lasting, and more reliable piece of equipment, reducing compressor energy costs by 15-25%.

Plate Coolers/Pre-Coolers: Take advantage of the heat at which milk leaves a cow by passing it through an exchanger in the opposite direction of cool well water, separated by metal plates. The milk's heat transfers to the water, making both end processes – heating water for washing and cooling milk to its ultimate storage temperature – more efficient and less costly.

Variable Speed Drives: Use a VSD on milking vacuum pumps to reduce energy expenditures by 50% or more and pay back the initial cost of installation in 1-3 years.

Automatic Take-Off Milkers: Preset the flow level at which milking claws are removed, preventing over-milking and reducing run-time of the vacuum system.

Additional Resources

"The Dairy Energy Self Assessment Tool"

See: http://www.ruralenergy.wisc.edu/conservation/dairy/default_dairy.aspx

Milking equipment efficiency calculators and incentives

See: <http://www.alliantenergy.com/UtilityServices/ForYourFarm/EnergyConservation/014711>

Case studies, comprehensive guides for dairy farmers, and other resources

See: http://mnproject.org/e-EE_ResourceCenter.html