

Discover what farm energy efficiency can do for you.



Energy Saving Ideas: A Quick Guide For Dairy Farms

Courtesy of Efficiency Maine



Dairy farms are facing some difficult financial challenges. Investing in energy efficiency is one way to help cut costs on the farm. There are many programs across the country that can help defray the cost of this equipment. Below is a quick set of best practices that you can look at and see if any of them are right for your dairy operation.

1) Do you use variable speed drives on your milking machines?

Your vacuum pump is a major energy user. Variable speed controllers can cut your vacuum system energy costs in half. Traditional pumps with single speed drives operate at a constant speed of 7 to 10 cubic feet per meter (CFM) per milking unit. By installing a variable speed drive (VSD) on the pumping system, the speed can be reduced to 2 CFM per milking unit. The VSD unit adjusts the vacuum pressure so that it uses no more suction pressure than is needed, while still preventing bacteria from entering the cow's teat.

2) Do you use a water-cooled plate cooler?

This technology will save money by reducing the number of hours your compressor operates, helping cool milk faster and reduce milk agitation. Plate coolers, also known as plate heat exchangers, use well water to cool milk as it moves from the milking system to the bulk tank. On average, milk comes from a cow at 101 degrees Fahrenheit and generally cools down to 95 degrees Fahrenheit by the time it enters the storage tank. A plate cooler speeds the cooling process so that the milk reaches the storage tank at 55-70 degrees Fahrenheit—over 30 degrees lower. Because the milk has been pre-cooled, the storage tank's compressors use less energy to chill the milk to the desired temperature.

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3) What type of compressor do you use?

The newer scroll compressor systems typically save 15 to 25 percent of electrical costs over reciprocating compressors. The compressor is a critical part of your milk cooling system, affecting milk quality, system reliability, and system efficiency. Scroll compressors use a spiral process that discharges fully pressurized gas refrigerant. They are quieter and more reliable than traditional compressors. Designed to “wear in”, not out, they improve with time and last longer. Additionally, they operate in cool weather, with the need of a crankcase heater.

4) How do you heat your water?

You may want to consider installing a heat recovery system, which would use the heat from your compressor to pre-heat water. This can cut your water heating costs in half.

5) Are your fans working for you?

Effective and efficient fans can improve production and save money. High volume, low speed fans are an efficient way to move large amounts of air and make less noise than standard fans. For 36 or 48 inch fans, look for an efficiency rating of at least 20 CFM per watt.

6) Are your lights energy efficient?

If not, consider T8 fluorescent lamps in a barn stall or pulse start metal halide lights in a free stall facility. Replacing older incandescent light bulbs and fixtures with energy efficient ones can save up to 75 percent on lighting costs. Specify dust and water tight fixtures for electrical safety.

7) Are you considering switching to long day lighting?

Some dairy operations are choosing to employ long day lighting practices, or photoperiod control, in their barns. Studies have shown that this process of exposing cows to supplemental light can increase milk production by between 5 percent and 16 percent. When you have the lights on for 16 or 18 hours per day, you want to make sure your equipment is as energy efficient as possible.

8) Do you have a plan in place for replacing failed equipment?

By developing an equipment replacement plan you can be ready when equipment fails. Specifying premium efficiency motors, scroll compressors, or blower style vacuum pumps will allow you to receive the benefits of energy efficiency, when your equipment does require replacement. For example, the initial cost of a motor is a mere fraction of what it will cost to operate that motor over its life. Plan ahead, and you will reap the benefits for years to come. Don't get stuck with inefficient equipment that you may use for the next 20 years. Let your vendors know you want to purchase the most efficient equipment that makes economic sense for your application.