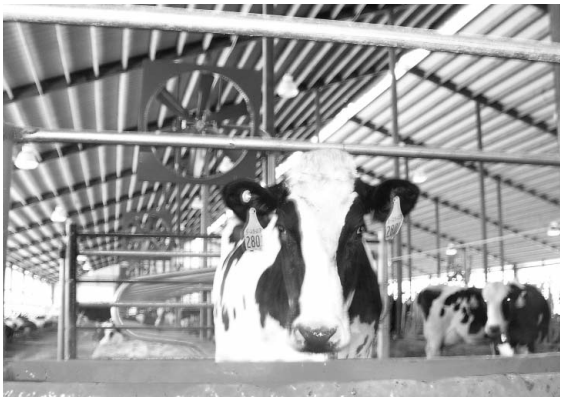
BUSINESS PROGRAMS

Soaring Eagle Dairy Increases Production with Fans

CASE STUDY

For more information call 800.762.7077 or visit focusonenergy.com

Jim and Sandy Fitzgerald had 20 plus years of farming experience when in 1980, they built a 60-cow tie-stall barn. By 1994, the Fitzgerald's milking herd size had increased to 90 cows. Three years later, in 1997, Soaring Eagle Dairy was formed and a 400 cow freestall barn was built in Newton, WI. Soaring Eagle Dairy's current owners are Jim and Sandy Fitzgerald, their daughter Kelly and her husband Brian Goehring and their two daughters, Julie Maurer and Stacy Fitzgerald. Soaring Eagle Dairy is milking 760 Holstein cows with a daily production average of 90 pounds per cow per day. The freestall barn will help them achieve their goal of increasing the herd size to 1,050 milking cows and the hopes of increasing daily milk production to 100 pounds per cow per day.



At Soaring Eagle Dairy barn, fan cooling and ventilation is for the cow.

Most freestall dairy barns are naturally ventilated, and will remain reasonably cool and fresh as long as air movement is generated by the wind. Researchers have determined that air should move past a cow at 200 to 430 feet per minute to provide beneficial rates of heat and moisture passage through a cow's coat during warm weather. Often, during the hot, muggy summer weather, there is not enough wind to produce the desired air flow rates. The solution is to use supplemental cooling fans. Over the past year, Soaring Eagle Dairy has

Soaring Eagle Dairy animal housing and milking facilities.

made a point to install multiple fans in order to increase cow comfort and production. "In past years when we didn't have fans, production was reduced by eight to ten pounds per cow per day, without full production picking back up until the fall, up to four months later," said Fitzgerald.

There are numerous factors to compare when trying to choose the right fan for any dairy application. There are also a wide variety of manufacturers and options available to make sure dairy farmers choose the appropriate equipment for their needs. Focus on Energy recommends installing fans that are in the top 25 percent of fan efficiency, based on findings by the University of Illinois, Department of Agricultural and Biological Engineering. For additional information, please visit our Web site at focusonenergy.com for a copy of our fact sheet entitled, "Ventilation Fans for Animal Housing."

FAN SELECTION TIPS

You should consider many parameters when determining the size and number of fans required for ventilation.

- Focus on Energy provides incentives for fans based on their rating of cfm/watt at 0.00 static pressure based on BESS lab testing standards.
- Please visit focusonenergy.com or call 800.762.7077 for details regarding incentives and qualifications.

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Optimal spacing and adequate fan capacities are necessary for an effective cow cooling system.

- Generally, larger diameter fans will be more efficient than smaller fans.
- Fans with a discharge cone will be more efficient than those without.
- Motor efficiency will affect energy use and the motor's speed can affect efficiency and noise levels.
- Fan blade tip speeds greater than 4,500 feet per minute will create excessive noise levels. To keep noise levels low, fan revolutions per minute (rpm) should be less than 720, 480, 360 and 320 rpm for fan sizes of 24", 36", 48" and 54", respectively.
- Machete, or straight, and teardrop blade designs are more efficient and accumulate less dust than cloverleaf shaped fan blades.
- The clearance between the fan blade and the housing will affect efficiency and the static pressure at which the fan is capable of operating. Large clearances will allow air to leak back past the fan blade and housing. If the entrance of the housing to the blade is smooth and rounded, it will reduce the turbulence and drag of the air as it enters the fan blade air foil.

Jim Fitzgerald said, "The fan installation in the freestall animal housing facility is all about cow comfort. Cow cooling with fans maintains milk production during warm weather and reduces animal breeding problems during extreme hot spells."

A combination of feed alley sprinklers and circulation fans provide the greatest cow cooling in extreme heat.

The fans were purchased from a Focus on Energy Program Ally, Braun Electric in St. Nazianz. Soaring Eagle Dairy has installed 31 fans for a total of 44,100 kWh and 15.43 kW in demand savings, which translates to $3,700 in annual energy cost savings at $0.084 per kWh. Because the fans were installed, "We were able to maintain 88 pounds of milk per cow per day even during the unusually high heat during the summer of 2005," said a Soaring Eagle Dairy staff member. "These fans helped increase our profits and improve the bottom line." Using a conservative estimate of eight pounds per cow per day increase in milk production and $13 per hundred weight (CWT) price for milk, the 760 Holsteins are producing an extra $95,000 of revenue during the four months leading up to fall.

Energy Savings for Soaring Eagle Fan Installations

Year Installed	# of fans Installed	kWh Savings	kW Savings	Energy Cost Savings
2004	3	2,520	0.87	$214*
July 2005	6	8,910	3.12	$748**
August 2005	22	32,670	11.44	$2,744**

*Based on rate of $0.0849/kWh **Based on rate of $0.0840/kWh

Estimated Annual Savings per Energy Efficient Model

Fan Size	# of fans Installed	kWh Savings	kW Savings	Energy Cost Savings
36" diameter	1	1,050	.37	$90
48" diameter	1	1,400	.49	$120
54" diameter	1	1,580	.55	$135

Savings Calculations use a rate of $0.0857/kWh

Focus on Energy works with eligible Wisconsin residents and businesses to install cost effective energy efficiency and renewable energy projects. Focus information, resources and financial incentives help to implement projects that otherwise would not be completed, or to complete projects sooner than scheduled. Its efforts help Wisconsin residents and businesses manage rising energy costs, promote in-state economic development, protect our environment and control the state's growing demand for electricity and natural gas. For more information, call **800.762.7077** or visit **focusonenergy.com**.

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