

Berner International Corp. Griesen's Dairy Farm



Dairy farm's challenge with milking units' winter freeze-ups gets thawed with air curtains

Wisconsin subfreezing winters take a toll on milking parlor's equipment, but air curtains above cow entryways retain heat inside

Prairie du Sac, Wis.--Holy cow! Milking parlors on dairy farms are yet another application for air curtains, the energy-saving devices that keep outdoor and indoor environments separate at open doorways.

After decades of energy-saving applications for industrial openings and more recently for commercial building entrances such as hospitals, hotels and schools, air curtains now have been proven successful at preventing milking parlor equipment freeze-ups on dairy farms.

Milk productivity setbacks were frequent challenges from November through March during subfreezing days for Griesen's Family Dairy located 60 miles northwest of Madison, Wis., in Prairie du Sac, Wis.. The medium-sized 680-cow farm suffered product losses, production delays from automatic milking equipment freeze-ups nearest the parlor entrances, and potential injury issues from slippery floors and poor indoor air comfort for employees.

Materials handling equipment dealer Bernie's Equipment Co., Holmen, Wis., recommended air curtains by Berner International, New Castle, Pa., to retain heat in the milking parlor.

On ambient temperature days above 32°F, the floor's radiant system supplied by a 400,000-Btu, stainless steel, 95.1-percent efficient Munchkin boiler manufactured by Heat Transfer Products, Scottsboro, Ala., combined with each cow's inherent 4,000-BTU/hr heat output, adequately maintains the milking parlor's target temperature range of 38°F to 40°F. The heating system was adequate despite the fact co-owner Hans Griesen prefers the two 16 x 8-foot entryways to remain open through three daily shifts for optimum productivity and animal movement in and out of the 24-stall herringbone-style milking parlor manufactured by DeLaval/Germania, Vernon Hills, Ill. On subfreezing days however, the heating system couldn't maintain set point temperatures near the entryway. Griesen first tried portable salamander forced-air heaters. The entrances were warmer, however the \$100/day cost for fuel, kerosene emission odors and potential fire hazard, sent Griesen looking elsewhere.

An employee dedicated to opening and closing the two doorways all day was considered cost prohibitive, even at minimum wage rates, according to Griesen. Griesen also considered both strip curtains and air curtain technology so the entry doors could stay open. Strip curtains were too obstructive to the animals. His first review of an air curtain at a nearby farm wasn't a positive experience, either. The farm used an inexpensive foreign air curtain brand with short lengths bolted in tandem to span the wide doorway. The air curtain was noisy, its modular construction vibrated and it didn't provide the proper volume, velocity or uniformity of air stream to prevent outdoor air infiltration, according to Griesen.

Finally, Clyde Conger, Bernie's general sales manager, and Berner manufacturer's representative, Tim Sprede, vice president-sales, MII Equipment, Milwaukee, Wis., worked with factory sales engineers to specify two USA-made, 16-foot-long, one-piece air curtains from the Berner's VSA model product line. The air curtains are mounted above the milking parlor's open doorways and retain up to

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Although Griesen's main concern was subfreezing air infiltration, the air curtains are also saving the facility energy, because of the radiant floor system's boiler cycles on less to maintain the set point temperature.

80-percent of the facility's energy even during wind loads of up to five-mph. Each air curtain features a corrosion-resistant powder-coated finish, five high-efficiency 1/2-hp motors and a welded aluminized steel frame that retains a strong structural integrity they span across such a wide opening. Consequently, there are no gaps in the 7,631-cfm, 1,635-fpm air stream it provides across the 16-foot-wide entryways.

"Hans had already educated and sold himself on the air curtain concept before we got involved; therefore he knew exactly what he wanted and had designed the application in his head," said Conger.

"Some of our co-workers were skeptical as to whether air curtains would solve the problem, but they're believers now since we haven't had any more frozen equipment issues," said Griesen, who hired a carpenter to reinforce the doorway headers that receive the air curtain support brackets. "One employee took infrared color temperature readings and there was a big difference in temperature inside the doorway with the air curtains on and off."

Air curtains consist of fan motors, blowers, nozzles and directional vanes and a control package. When properly engineered for the proper horsepower, nozzle discharge and airstream angle, an air curtain essentially "seals" a doorway from outdoor elements, flying insects and dust. The airstream must strategically "break" at the threshold of the doorway for ultimate performance. While air curtains are typically activated by a plunger switch after a door opens, the milking parlor air curtains are activated by a thermostat located near the entrance. Gas-fired hot water or steam, and electric heating coil options were considered, however Griesen felt the milking parlor's heat radiant heat system was sufficient if cold air infiltration could be curtailed.

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- energy efficient metal halide fixtures with lamps by Sylvania.
- variable frequency drive on the milking vacuum pump
- four scroll compressors by Copeland--div. of Emerson Climate Technologies, Sidney, Ohio, for milk refrigeration.
- two heat exchangers by DeLaval/Germania for compressor heat recovery
- plate cooler by DeLaval/Germania.

All the efficiency equipment combined saves the farm an estimated \$35,000 annually in energy savings, according to Griesen.

While the milk producers association, the Dairy Council of California continually uses its "Got Milk?" campaign to advertise milk's benefits to consumers, Griesen's air curtain success should prompt dairy farmers to ask themselves, "Got Air Curtains?"