



Ventilate Barns to Prevent Cow Heat Stress

By making small changes to your barn's structure, you can increase the barn's natural air flow and keep your cows cool.

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Provide a ridge opening in your barn's roof to improve air circulation inside the barn and keep cows cool.

During warmer temperatures, poor ventilation in barns may result in cows expressing obvious signs of heat stress, such as breathing heavily or panting.

"Cows are much more cold tolerant than we are and much less heat tolerant than we are," says Jeffrey Bewley, assistant extension professor in the University of Kentucky College of Agriculture's Department of Animal and Food Sciences. Cows begin to experience heat stress when the temperature humidity index exceeds 72 degrees F.

Historically, dairy barns were constructed like houses, striving to keep barns closed-in to protect cows from winter weather. However, building them that way ignored the fact that cows have a different temperature comfort range than people. Research shows that average lying-down time decreased from 10.9 to 7.9 hours per day as temperatures increased. Thus, cows may alter stall usage if barns are not adequately ventilated.

Poor ventilation in barns can result in increased respiratory problems and increased transmission of diseases. Lack of proper ventilation can lead to high moisture levels, manure gases, pathogens and dust concentrations, which create an adverse environment for dairy cows.

"For optimal production and well-being, producers should provide dairy cows with a constant supply of fresh, clean air," Bewley says. "Frequently exchanging air removes or reduces the concentrations of dust, gases, odors, airborne disease organisms and moisture."

Ventilating Barns

Maximizing natural ventilation is the first step toward improving overall ventilation, Bewley stresses. Natural ventilation relies on barn openings and orientation to remove heat and humidity from the cow's environment.

Exhausted air generally leaves the barn through sidewalls and ridge openings. Although old barn designs suggested closed-in barns, current recommendations are to open the barns up to allow for better air exchange. Sidewalls allow for air, heat and humidity to be easily and continuously removed from the barn.

"All of this is particularly critical during the summer," Bewley says. "If producers are concerned about the potential negative effects of open sidewalls during the winter, sidewall curtains, which can be raised in the summer and lowered during the winter, may be added to eliminate this concern."

A ridge opening should also be provided on the roof of the barn to facilitate air removal, he says, allowing warm, moist air to rise and exit the barn, even on calm days. The ridge opening should be at least 2 inches per 10 feet of barn width. With overshoot barn roofs, the ridge opening should be at least 3 inches per 10 feet of barn width.

The steeper the barn roof slope, the better the movement of the warm, moist air out of the ridge vent. Bewley recommends a barn-roof slope of at least 3 inches of rise to 12 inches of run, but a slope of 4 inches of rise to 12 inches of run is preferred.

"Producers are often resistant to this change because of fears of precipitation entering the barn through the ridge opening," Bewley says. "Although this is generally not a major problem, a ridge cap may be added to eliminate this concern. A few weeks ago, I visited a producer in western Kentucky who had constructed a new barn with an open ridge vent. He said he was considering opening the ridge vent in his older free-stall barn because he was so pleased with how the cows responded to the new barn. He recognized that he could see dramatic improvements in cow comfort in his old barn without spending a lot of money."

For many older barns with ventilation problems, the main opportunity for improvement is removing tin or wood sidewalls that block natural winds from entering the barn. Before removing these obstructions, consider how this change might affect the structural integrity of the barn, Bewley explains. Producers may also supplement natural ventilation with mechanical ventilation by adding fans.



“Adding fans to an existing freestall barn is one of the highest return investments a dairy producer can make,” he says.