Cows Can Keep Udderly Cool Thanks To Barn-Ventilation Advances

ITHACA, N.Y. — For many dairy cows, summertime living isn't easy.

In the northeastern U.S., heat stress can make the animals more susceptible to mastitis, laminitis, and acidosis. It can also adversely affect the growth rates of unborn calves and reduce a cow's capacity to make milk by as much as one-third.

But the days of heat stress in the dairy barn are numbered.

Cornell University agricultural engineers have combined the latest technology in keeping cows cool in commercial barns using three tools not previously combined: a time-integrated variable (TIV) environment controller, tunnel ventilation, and an evaporative cooling process.

Construction of a pilot barn in St. Lawrence County, N.Y., is scheduled for completion in late July, and milk production is slated to begin Aug. 1. If the cooling project is successful, dairy producers will be able to install the technology in existing structures.

The strength of the system is that it is automatic, said research engineer Curt A. Gooch, dairy facilities specialist for Cornell's PRO-Dairy Program with the Department of Biological and Environmental Engineering. Gooch worked on the pilot project with Michael B. Timmons, Cornell professor of Biological and Environmental Engineering.

"This system assesses the barn environment and runs the systems automatically," said Gooch.

The brain behind the ventilation system is the TIV, which commands both the ventilation and cooling systems in the barn. Like a computerized thermostat, the controller accounts for the barn's air temperature and the target temperature set by the barn manager.

Unlike a thermostat, the TIV assesses the barn's inside temperature for a 12-hour rolling temperature average. It also calculates and maintains a running record of the average temperature inside the barn for the previous 24 hours. When controller sensors register cow heat stress at around 70 degrees Fahrenheit, the TIV turns on a bank of large fans and, if necessary, the barn's evaporative-cooling equipment. The fan's tunnel-effect ventilation and the evaporative cooling system remove the accumulated heat, thus cooling the cows.

Inside a freestall barn that can house about 200 cows, the system moves the air quickly at about 500 to

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