

New air recovery system could save poultry farmers millions annually

July 16 2015, by Jeff Sossamon



Shawn Xu developed a waste-heat recovery system to make heating poultry barns more even, efficient and cost-effective. Credit: Shawn Xu

One of the largest variable expenses in poultry production is heating the barns in which chickens and turkeys are housed. Now, a team of

researchers and engineers from the University of Missouri have developed a waste-heat recovery system that could lead to significant savings in propane costs for farmers and producers heating their poultry barns. Scientists believe the energy efficient ventilation system also could be critical to maintaining air quality for birds and keeping the birds healthier while reducing the need for antibiotics.

Almost 100,000 [poultry](#) barns exist in the U.S., and total farm value of poultry production exceeds \$20 billion a year, according to statistics released by the U.S. Department of Agriculture (USDA). Typically, turkey poultry farmers will spend about \$30,000 a year in propane costs in one brooder barn to maintain an ideal temperature for raising healthy birds. The waste-heat recovery system designed by Mizzou scientists may help defer some of these costs—even in colder climates.

"Chickens and turkeys need a constant, moderate temperature to thrive—even in warmer spring and summer weather," said Yun-sheng "Shawn" Xu, an associate research professor of civil and environmental engineering in the MU College of Engineering. "Our goal is to reduce propane consumption in [poultry farms](#) by 60-70 percent of current levels, so producers can fill their propane tanks only once a year—and if they can get them filled in warmer weather, when propane prices are even lower, there's a considerable savings. If fully implemented nationwide, this could equate to hundreds of millions saved each and every year."

Xu, who also served as a consultant in use of geothermal heating and cooling systems for the 2008 Olympic facilities in Beijing, and Tingsheng Xu, a research associate at the MU College of Engineering, devised the waste-heat recovery system that works with the air ventilated from poultry barns. The warm air that is normally exhausted as waste is pushed through a grid of tubing located in the fresh-air ventilation inlets. As the air exchange is made, the heat from the exhaust warms the fresh

air; therefore, heaters located in the barns have to work less to heat the inside of the buildings.

The team licensed the technology from MU and started production in Boonville, Mo. Waste-heat recovery systems have been installed in turkey, broiler and egg layer barns in Missouri and Minnesota. Xu and his colleague Jeff Firman, a professor of animal sciences in the MU College of Agriculture, Food and Natural Resources, have noticed significant improvements to [poultry production](#) that could help farmers. Impacts could include lower labor costs, environmental improvements and reduction of disease among chickens.

The system allows for an even distribution of cleaner and warmer air, which has eliminated cold, wet spots in the barn," Xu said. "The system also helps reduce dust and ammonia levels, which helps reduce respiratory problems for the birds making them more resistant to avian diseases."

Provided by University of Missouri-Columbia

Citation: New air recovery system could save poultry farmers millions annually (2015, July 16) retrieved 18 April 2024 from

<https://phys.org/news/2015-07-air-recovery-poultry-farmers-millions.html>

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