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College of Agriculture,
Food and Environment

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<http://www.uky.edu/bae/energy-audit-program>



Broiler houses, such as this one, have been audited to increase energy efficiency through the Energy Audit Program.

When you support Extension, poultry producers gain awareness and solve production efficiency challenges to improve profitability.

Kentucky Poultry Producers Improve Operations through Energy Efficient Enhancements as a Result of Biosystems and Agricultural Engineering Department Expert Facility Audits

“USDA appreciates the partnership efforts of the University of Kentucky with assisting poultry producers when evaluating their energy operational costs and implementing ways to integrate energy efficiency practices through the USDA Rural Energy for America Program,” said Thomas G. Fern, state director for USDA Rural Development operations in Kentucky.



The engineering energy assessments conducted on 144 poultry farms identified improvements that could save about 20% of the total electric and fuel energy use on the average farm. The estimated annual value of energy savings was \$1.05 million per year, or \$7,300 per farm.

Broiler production is highly energy intensive, with fuel and electricity costs accounting for 20% to 30% of the broiler grower's expenses (Cunningham & Fairchild, 2011). In 2008 to 2010, Kentucky Cooperative Extension Service agricultural engineers and poultry scientists conducted a project to help 40 selected broiler growers identify potential energy saving improvements and their respective payback. Outcomes of the project shared with other growers throughout Kentucky to assist them in making energy saving improvements.

Extension engineers from the Biosystems and Agricultural Engineering (BAE) Department, including key personnel Drs. Doug Overhults and Sam McNeill, were asked to provide technical assistance in the form of energy efficiency assessments by the United States Department of Agriculture Rural Development and the Kentucky Agricultural Development Board. The USDA Rural Development and Agricultural Development Board identified the necessity for improving the poultry commodity within the state and made some cost share funding available annually for producers to make agricultural and rural energy efficiency improvements. In order for producers to receive funding, energy efficiency assessments are required as part of the cost share funding application.

From 2008 to 2014, the BAE engineers provided energy assessments through the Rural Energy for America Program (REAP) Energy Audit Program for 144 Kentucky poultry farms so they would be able to apply for cost-share funds to install energy efficiency improvements on their production facilities. Most farms assessed had two or more potential energy efficiency improvements, of which adding ceiling insulation and changing from incandescent to fluorescent lighting were two frequently applied improvements. These two improvements usually had a simple payback of less than 5 years. Several farms also had potential energy savings from closing and insulating sidewall curtains, installing attic air inlets, or installing insulated doors over summer ventilation air inlets.

Proposed projects for the 144 farms required an estimated \$6.2 million in total investment. Approximately 30% of the total cost was supported by cost-share funds with growers contributing the remaining 70% of the cost. Energy assessments



Older poultry houses often have many cracks and crevices that allow cold air infiltration. Sealing cracks and filling the openings with insulation provides significant energy savings and greatly improves operation of the ventilation system that provides fresh air and removes moisture from the house.



Compact fluorescent, or LED, lights have proven to be one of the best energy saving investments on a poultry farm. The simple payback for a lighting retrofit has been less than a year on many farms.

showed that the estimated annual value of energy savings was \$1.05 million per year, or \$7,300 per farm. The estimated simple payback for all projects was 5.9 years before applying any cost-share assistance or tax credits that was received by the growers.

On average, BAE engineers contributed a full day per farm assessed. Without the assistance of the BAE engineers, producers would continue to lose money in facilities lacking energy efficiency. This project has been a collaborative effort with USDA Rural Development (KY Office), KY Governor's Office of Agricultural Policy, and private grant writers.