FLINTROCK FARMS

A Poultry Farm Case Study

Mathias Ag Program

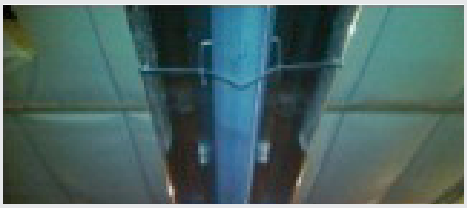
Maryland Energy ADMINISTRATION
Powering Maryland's Future

Dan Heller operates two poultry farms and a horse stable, with property in two states. As a third-generation farmer, he knows the best way to plan for the future of his farms is to maximize their growth through efficiency and environmental sustainability.

Flintrock Farms, Dan's broiler farm in Church Hill, Maryland, spends about $100,000 each year on energy costs to raise over 700,000 birds. To learn how to reduce this energy cost to free up funds for other business purposes, Dan requested an energy audit on his six-house broiler farm in 2010. The farm energy audit uncovered opportunities to save 20% of that cost through equipment replacement. Dan evaluated ways to implement the recommended measures for a few years. When Dan learned of a new grant opportunity through the Kathleen A.P. Mathias Agriculture Energy Efficiency Program to help pay for the cost of installing the measures, he jumped at the chance to make the following efficiency improvements to his farm:

LED bulbs are dimmable and use only about 15% of the energy of incandescent bulbs. They also last much longer than any other current lighting option.

Radiant tube heaters are a more efficient way of warming the birds. Instead of heating the air, radiant heaters direct heat to the objects in the house such as the walls, floor, and chickens.



Attic inlets recover solar heat from the attic of poultry houses. They capture and reuse the warm air from the chicken house attic on winter days. They can also help lower the relative humidity in the house and reduce litter moisture.

Stir fans circulate heat throughout the house to reduce temperature variations. Uniform heat distribution from the ceiling to the floor allows the heating system to operate less frequently.

Brood curtains reduce heating requirements by minimizing the heated area of the house when the birds are small. Using an insulated brood curtain decreases the amount of energy lost in heating the area.

Farmers who cannot invest in all technologies at once may choose to tackle the shortest-payback measures first. In Flintrock Farms' case, adding stir fans and replacing forced air heaters with radiant tube heaters provide the quickest payback (see Table 1).

Table 1: Implemented Efficiency Measures and Associated Savings

Recommended Measure	Electric Savings (kWh)	Propane Savings (gal)	Estimated Annual Energy Cost Savings	Installed Cost	Estimated Payback in Years
Lighting Replace 92 8-watt dimmable cold cathode bulbs, 28 23-watt compact fluorescent (CFL) bulbs, and 4 40-watt CFL bulbs per house with 124 6.7-watt dimmable light emitting diode (LED) bulbs per house for houses 1-6. Replace (120) 100 watt dimmable incandescent bulbs and (4) 150 watt dimmable incandescent bulbs per house with (124) 8 watt dimmable light emitting diode (LED) bulbs per house for houses 7-9	50,977		$5,558	$35,149	6.3
Radiant Tube Heaters Replace 4 forced hot air heaters per house with 4 125,000 Btu/hr radiant tube heaters per house.		3,443	$5,945	$38,960	6.6
Attic Inlets Install 20 actuated attic inlets per house Install 1 electronic control unit per house in houses 7-9 that will actuate attic inlets.		2,722	$4,700	$42,824	9.1
Stir Fans Install 8 variable speed drive 18" basket fans per house to the ceilings of houses.	(5,525)	1,530	$2,040	$23,981	11.8
Brood Curtains Replace 2 existing un-insulated brood curtains per house with 2 insulated brood curtains per house. Insulated brood curtain should have a minimum R-value of R-2.5.		212	$366	$9,078	24.8
Totals	**45,452**	**7,907**	**$18,610**	**$149,992**	**8.1**

Dan had the equipment installed in February 2013 between broods and could not be happier with the results. "The new equipment is the right choice for my farm," says Dan. "Every business is looking for ways to cut costs without sacrificing productivity, so it makes sense for growers to look at where they can save energy costs."

Many poultry farms can benefit from energy efficiency measures similar to the ones Flintrock Farms implemented. Even without the grant, the recommended upgrades would pay for themselves in about 8 years—a relatively short time for a farm looking to stay in business for the next generation.