

DEERFIELDE FARM

A Poultry Farm Case Study

Mathias Ag Program

Maryland's poultry industry is an important part of life for Deerfielde Farm owner Jenny Rhodes. In addition to operating her own broiler farm in Centreville, Maryland, she is president of a major poultry trade association and an extension educator in the College of Agriculture & Natural Resources for the University of Maryland Extension.

After a 2007 farm energy audit, Deerfielde Farm invested in radiant tube heaters and ceiling insulation in four poultry houses. With annual electricity and propane costs to raise 480,000 birds still in excess of \$20,000, Jenny seized the opportunity afforded by the Kathleen A.P. Mathias Agriculture Energy Efficiency Program to implement additional measures in 2013. Taken together, these improvements will reduce energy use in the poultry houses by more than 30%:

Insulated solid sidewalls, made with R11 insulation and plywood, are an improvement over curtain walls because they allow better control of temperature and humidity. They reduce heat transfer and air infiltration, another cause of heat loss.



Insulated 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.



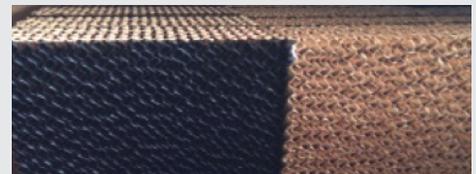
Vent boxes must be in good repair to avoid allowing air to leak in when the vents are closed. In well-sealed buildings with minimal air leakage, vent boxes use the static pressure difference of the outside and the inside air to ventilate without allowing cold air to drop on the birds.



Electronic control units coordinate heating, cooling, ventilation and lighting systems so they work in an integrated fashion and maintain optimum growing conditions while minimizing energy use. They also allow the producer to view the poultry house conditions remotely.



Cool cells are a form of evaporative cooling used in poultry houses. They allow fans to run less frequently, which results in energy savings.



Insulated tunnel doors provide more insulation and a better seal for tunnel inlets than a traditional tunnel curtain.



Sidewall ventilation fans provide ventilation in winter when the farm is not using the tunnel ventilation fans. The replacement fans are more efficient than the old ones and offer significant energy savings.



Deerfielde Farm's energy efficient upgrades will save the farm over \$6,500 in energy costs each year. While some of the measures have a long payback period, they represent a good value for the farm because they will help improve the health of each flock—a benefit that translates to higher profits.

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
Curtain to Solid Insulated Sidewalls Renovate remaining 5 curtain walls to solid sidewalls and insulate with a minimum of R-11 wall insulation.		1,215	\$1,749	\$33,407	19.1
Insulated Brood Curtains Replace 2 existing uninsulated brood curtains per house with insulated brood curtains.		103	\$148	\$2,600	17.6
Vent Boxes Replace 192 existing vent boxes with 192 new vent boxes.		562	\$809	\$8,730	10.8
Electronic Control Units Install electronic control unit in house #3 and integrate lighting, heating and ventilation systems with the new controller.		79	\$615	\$11,975	19.5
Cool Cells and Insulated Tunnel Doors Install 120 feet of recirculating cool cell per house and replace existing tunnel curtain material with insulated tunnel doors.	20,346	241	\$2,731	\$63,300	23.2
Ventilation Replace 2 old 36-inch sidewall fans per house with 2 energy efficient 36-inch sidewall fans per house. New fans have a minimum ventilation efficiency ratio of 18.9 CFM/Watt.	3,578		\$419	\$9,120	21.8
Totals	28,206	2,200	\$6,471	\$129,132	19.9

Jenny is pleased with the energy efficient poultry houses that enhance the health and productivity of her flocks. "I take pride in the appearance, environmental effectiveness and energy efficiency of my farm," said Jenny. "I am so glad these recent upgrades represent best management practices and I'm glad to be able to demonstrate their impact on my farm." As a community leader, she hopes to help other poultry growers realize the value of energy efficient upgrades—while preparing her operation for a sustainable future.