

# Energy Conservation and Efficiency in Farm Shops

Energy losses in farm shops resemble those in homes, but we often ignore these losses. The farm shop is usually not heated to as high a temperature as the home and not as constantly, but energy savings in the shop are attainable with some conservation and efficiency practices.

The first step to consider is to obtain an energy audit, especially if you feel you have high energy use in the shop. The energy audit for a farm shop is similar to one for a home. An energy audit is an in-depth examination that determines:

- if and how energy is being lost,
- which systems are operating inefficiently, and
- what type of cost-efficient measures can be implemented to make the farm more energy-efficient.

To explain further, an energy audit evaluates the current energy usage, makes calculations of existing systems' efficiency and compares them to proposed new systems. The Agricultural Energy Management Plan (AgEMP) created afterward explains any energy-saving measures recommended for the shop. AgEMP reports may qualify for financial assistance from various funding sources, including but not limited to federal grants, loan programs or energy tax credits.

The MAESTRO program was created to strengthen the financial viability of Missouri's livestock producers through energy efficiency. All data on potential energy savings for shops were obtained through this program. Sixty farms representing beef, swine and dairy operations had their shops evaluated for energy usage. The energy savings came from updating lighting, insulating and sealing the

shops from air leakage, and upgrading to more efficient heaters. Of the 60 farm shops evaluated, the projected electrical savings were 88,160 kwh. The estimated payback on renovations was 9.7 years, using the estimated savings detailed in Table 1.

## Low-cost energy-saving practices

- AgEMPs generated through the MAESTRO program have typically found several ways for shops to conserve energy and save on energy costs.
- Seal holes that allow air to leak into the building.
- Turn down or turn off heat when the shop is not in use.
- Turn off lights when not in use. Consider motion detectors to automatically turn off lights when no one is in the shop.
- Seal leaks in compressed air systems. Leaks cause the compressor to run more often, wasting energy.

## Medium-cost energy-saving practices

- Add insulation to the shop if insulation levels are low. R-values of 15 to 20 are best for side walls, 30 for the ceiling and 10 for doors.
- Replace doors and windows that are in poor condition. Adding storm windows can also help reduce energy loss.
- Use zone heating and only heat the area in which you are working. There are a variety of heaters that will suffice to heat the work area.
- Replace incandescent or inefficient fluorescent lights with more efficient lighting.

## High-cost energy-efficiency practices

- Replace heating systems. This is most practical when the existing system is near the point of failure. Consider using waste-oil heaters or other renewable energy sources that could be produced on the farm.
- Add insulation as necessary. The expense of the job will depend on how much additional insulation is needed.

**Table 1. Average estimated savings per farm**

	Estimated savings (mmbtu)	Installed cost	Installed cost	Electricity saved (kwh)
Total	783.48	\$228,358.49	\$23,464.97	88,160.41
Average per farm	13.058	\$3,806	\$391	1,469.01

Written by

**Don Day**, Extension Associate, College of Agriculture, Food and Natural Resources

**Amanda Marney**, Extension Associate, Department of Biological Engineering

**Joseph Kendrick**, Extension Associate, Department of Biological Engineering

**Brian Robertson**, Extension Associate, Department of Biological Engineering

## Additional information:

Energy Fundamentals for Farm Lighting at <http://farmenergy.exnet.iastate.edu/wp-content/uploads/downloads/2012/02/PM-2089N.pdf>

Farm Lighting Energy Efficiency Checklist and Tips at <http://www.extension.org/pages/32591/farm-lighting-energy-efficiency-checklist-and-tips>

### ALSO FROM MU EXTENSION PUBLICATIONS

- G1976 *Top Money-Saving Practices on Missouri Dairy Farms*
- G1977 *Top Money-Saving Practices on Missouri Poultry Farms*
- G1979 *Energy Efficiency and Farm Water Systems*

**[extension.missouri.edu](http://extension.missouri.edu) | 800-292-0969**