



Benchmarking energy usage for swine producers

Two of the most important concepts for managing energy consumption in swine facilities is knowing how much energy is being used and how much should be used. Benchmarking enables facility managers to compare their energy consumption to other, similar facilities in order to determine if energy expenditures are reasonable. Unusual or erratic data can then be explored further to find potential waste.

For this case study, data from 30 production facilities in Iowa, Minnesota and Missouri was analyzed and presented in the table below. Facilities were categorized into finishing swine (pigs reared from 50 pounds to market), wean-finish (pigs reared from 15 pounds to market) or sow farms (breeding, gestation and farrowing). Finishing and wean-finish were further broken down into tunnel barns, where ventilation is supplied entirely from fans which pull the air from one end of the barn to the other, and curtain sided barns, where fans are used for winter ventilation but the higher ventilation stages are provided through openings on the sidewall with the wind.

As expected, electrical cost per pig space was greater for tunnel-ventilated barns than curtain-sided barns (using fans for ventilation in winter and sidewall ventilation curtains in warmer weather), independent of animal size. It was also expected that those farms which have wean-finish facilities have much higher propane usage than do those that are purely finishing pigs. Most wean-finish barns utilize propane brooders to provide localized heating, allowing the room temperature to remain lower to minimize the use of propane space heaters. Sow farms varied greatly on propane usage but electrical usage was relatively consistent. Some participants kept poor records on propane usage and thus, the estimates are less reliable than the electrical data.

Table 1. Data summary from various swine farms.

| Description | Electrical usage/year kWh/pig space | Range | Propane usage/year Gallons/pig space | Range |
|--------------------|--|-------------|---|------------|
| Finishing | | | | |
| Curtain barn | 22.6 | 19.0 – 26.8 | <0.67 | 0.5 – 1.0 |
| Tunnel barn | 25.9 | 20.5 – 30.7 | <0.67 | 0.5 – 1.25 |
| Wean-finish | | | | |
| Tunnel barn | 31.3 | 27.5 – 35.1 | 2.6 | 1.8 – 3.3 |
| Sow farms | 240 | 282 – 225 | 6.1 | 12.3 – 1.2 |

It should also be noted that the values in Table 1 vary considerably within each type of building as well as between building types. Several factors could contribute to this variation. The time of year in which wean-finish or finishing



Additional resources:

More specific information can be found in these publications from ISU Extension and Outreach.

- [Managing swine ventilation controller settings to save energy](#)
- [Energy efficient fans for swine production](#)
- [Conserving energy by using localized heating in swine housing](#)
- [Sizing minimum ventilation to save heating energy in swine housing](#)



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buildings are stocked can influence the energy usage. Small pigs placed in winter will increase the propane usage while having large pigs in August may add to the electrical usage due to an increased need for higher ventilation rates for cooling. Geographical region and severity of seasonal temperatures may have influenced the data as well. Management such as controller settings, maintenance and building leakage can also impact these figures. Equipment selection and usage, such as stirring fans, can make a difference in baseline numbers as well.

What are good goals?

The best way to evaluate your energy consumption is to compare it to similar facilities in your geographic area. If you do not have other farms in your area with which to compare, Table 2 shows suggested goals for energy consumption per pig space per year.

Table 2. Suggested goals for swine facilities in the upper Midwest.

| Description | Goal for electrical usage | Goal for propane usage |
|----------------------------|---------------------------|--------------------------|
| Finishing (Curtain barn) | < 20 kWh/space-year | < 0.5 gallons/space-year |
| Finishing (Tunnel barn) | < 25 kWh/space-year | < 0.5 gallons/space-year |
| Wean-finish (Curtain barn) | < 25 kWh/space-year | < 3 gallons/space-year |
| Wean-finish (Tunnel barn) | < 35 kWh/space-year | < 2.5 gallons/space-year |
| Sow farms | < 240 kWh/sow-year | < 6 gallons/sow-year |

What can be done if my usage is higher than the suggested goals?

After making comparisons, if you feel your usage is higher than it should be, there are several things you can try to investigate further in order to identify areas for possible savings. Propane usage for a single year may not be a good indication of longer term averages. Loading piglets into a barn in January or during an especially cold winter may increase the usage for a single year. If you eliminate these factors from the data and average energy consumption still remains high, further evaluation may be necessary.

Propane is primarily used for building heating and the biggest source of excess usage tends to be over-ventilation or improper controller settings. It is possible that a simple adjustment to controller settings will remedy the situation. High electrical costs may be related to fan selection or management. Sub-metering equipment or observation of run cycles may help to diagnose a ventilation problem. More information about these issues is available in the Farm Energy (PM 2089) publication series from ISU Extension and Outreach.

Energy costs are a relatively small portion of overall production costs. However, energy consumption is a cost that can be minimized with proper management, thereby leading to a direct increase in profit. Being aware of these costs and then comparing them to benchmarking numbers will help you develop a plan to capture savings.