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*For more information, or
questions about how to
proceed with efficiency
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Energy Efficient Farms: HVAC



For farmers who use large animal barns as part of their operation, HVAC considerations are not only a huge concern for keeping the animals healthy and growing, it's also a significant user of energy. Heating and cooling barns uses a significant amount of energy to keep air at a given temperature, and to move that air throughout a facility. In order to keep energy costs as economic

as possible, farmers can utilize a combination of well maintained ventilation equipment, such as fans and shutters, and high quality insulation, which can maintain desired conditions over a long period of time.

Additional Facts:

- Large diameter fans are generally more efficient than small diameter fans. However, fans should not be oversized for their application, which would cause an unnecessary waste of energy.
- Inadequate insulation accounts for nearly 35% of air leakage in older buildings, driving up your heating and cooling costs.
- High Volume Low Speed Fans (HVLS) are a newer fan technology that uses a large fan diameter to move more air using less electricity than typical fan systems. These fans are better suited in some types of barns over others, so adequate research should be done before incorporating them on your operation.

Key Terms

CFM/Watt – cubic feet per minute, per watt. The most common term used to evaluate the efficiency of a fan; the amount of air a fan can move over a period of time using a given amount of energy.

R-Value – the primary standard used for judging insulation efficiency. The higher the R-Value the more effective the insulation is at trapping heat.

Utility Rebates

Rebates are often based on fan size and accompanying motor.



Rebates are available for insulation, thermostats, and many other 'non-fan' ventilation improvements.

Low Cost Preventative Maintenance

Clean fan guards and shutters regularly; dirty equipment can reduce fan output by as much as 40%.



Trim vegetation around your fan system. Unkempt bushes/trees can significantly reduce ventilation system performance.



Caulking and weather stripping barns to keep out unwanted drafts can restore building heat loss as much as 35%.

Cross Ventilation and Tunnel Ventilation

Debates persist on the issue of whether cross ventilation or tunnel ventilation systems are best at keeping animals comfortable. In a cross-flow system, air is moved through the sides of the barn, while a tunnel flow system moves air from one end of the barn through to the other. Because of the length the air must move in a tunnel system, experts argue that a greater chilling effect occurs in the tunnel system. Each system has its own design challenges, which include the amount of energy input. Make sure you factor energy (and fan equipment) costs into any considerations you may be having regarding each type of system. Increasing the amount of natural ventilation possible in each of these systems should also be a primary concern, with huge potential for energy savings.

Additional Resources

Energy Saving Ventilation Maintenance

See: <http://energy.cas.psu.edu/360.htm>

Efficient Animal Ventilation Systems

See: <http://www.extension.umn.edu/distribution/livestocksystems/DI0956.html>

Efficient Ag Buildings

See: <http://attra.ncay.org/attra-pub/agbuildings.html#Energy>