A Look at Optimizing Fan Winterization and the Impact in the Field.

Matthew Hicks leads research and education projects at the Double L Group, an Iowa based company. Matthew Hicks received his bachelor's degree in Civil Engineering from Georgia Tech. He earned his Master's degree from the University of Georgia specializing in Poultry Science Ventilation and Management under Mike Czarick.

He strives to progress the poultry industry through education and innovation while bridging the gap between theory and real-world application.

Part 1 – The Ventilation Challenge

A negative pressure pig barn operates effectively during most of the year, but wintertime conditions can pose a problem. The large deviation between indoor and outdoor conditions causes the system and the farmer to work harder to maintain the optimal environment for the pigs.

When a fan turns on to bring air into the barn, most of the air should be brought through designated inlets. However, if the barn is not properly sealed, air can enter the building through any opening which leads to cold air entering directly into the barn without properly mixing. The farmer must winterize the building to prevent unwanted cold, damp air from entering.

The increase in cold air creates higher demands on the heating system and in turn increases the heating costs.

Understanding the differences in fluctuating external barn temperatures and possible solutions, enable farmers to consider the options when winterizing the barn: plastic, tarps, or shutter blanks.

Part 2 – R-Values and Leakage

One area that should be sealed properly is the fan end of the house. During winter, the ventilation requirements are decreased, meaning some of the fans won't be in operation and can become areas of intrusion. Typically, the fans are not completely open to the outside. There is normally a shutter attached to the fan which provides some protection from the outdoor conditions, but often cannot fully eliminate the effects of air and water seepage.

Double L shutter blank installed in a pig barn.

Farmers will take preventative measures to winterize the shutters by covering these unused fans. When a farmer is deciding which winterization options to choose from, they must take into consideration the cost, performance, installation, and maintenance. The main feature that has a direct impact on production is performance. Performance can be broken down into R-value and reduction of air and water leakage.

R-value is described as a material's ability to resist heat transfer. A higher R-value means more effective heat retention within the pig barns. For reduction of air and water leakage, a seal must form between the inside and outside. Most of the time a seal is created by using a rubber gasket, while some options rely on negative pressure to form the seal between materials. Increased performance promotes lower heater run times and a better environment for the animals. A swine facility is large investment, so minimizing operating costs and is key to maximize profits. By maximizing the R-value and quality of seal, the fuel bill can be reduced which is one of the highest operating costs.

Part 3 – The Preferred Winterization Solutions that Works - Shutter Blank

Farmers have many responsibilities when managing a pig barn, so their time is valuable. They see value when equipment is easy to maintain and utilize, which is particularly important when it comes to cost-saving measures such as winterizing the buildings. Since shutter covers are an important part of the process, the farmer searches for a product that has a suitable R-value and protects against air and water leakage, while still being affordable and easy to maintain. When considering installation of the shutter cover, a superior design is one that attaches directly to the current shutter. The farmer can simply connect a frame to the shutter which allows easy attachment of the shutter cover when needed. If the farmer needs to use the fan, the cover can be removed quickly and stored until needed again. The cover should have a gasket around the perimeter to provide a good seal against the shutter frame, drastically reducing draught around the fan. All these features combined create the optimal product to winterize fans

Above FLIR photo was taken at a 2,400 head finishing site in eastern Iowa when the outside temperature was below 0° F temperatures.

54" fans are shown with cold air leakage coming into the facility – shown by the purple areas on the shutter front.

Above FLIR photo was taken at the same finishing site in eastern Iowa 15 minutes after the Shutter Blank was installed on the 54" fans.

Note the reduction in cold air leakage and insulation provided on the fans depicted by the uniform yellow / orange tones captured by the FLIR camera.

DOUBLE L GROUP LLC

About Double L Group

Since 1973, Double L has committed to providing high-quality products and services worldwide that are based on value, customer's needs, and excellent sales support. Double L Group, LLC strives to provide our distributors and customers with innovative products that offer the best return on investment.

Double L's product line creates a better environment for your animals with clean air and lower heating costs. op to their full genetic potential for outstanding production.