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COMPARING INSULATION? DON'T GET HOT!

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One of the important tools used in poultry housing is insulation. Radiant foil insulation have been advertised and promoted recently for use in poultry houses. Radiant barriers are but one of several kinds of insulation. Each type of insulation has advantages and disadvantages. The optimum type and level of insulation used for poultry houses will depend on the desired temperature, comfort, and cost.

Fiberglass, cellulose, foam, and other conventional insulations are rated with a "R" value. The greater the R, the better the insulation reduces conductive and convective heat transfer. Conduction is reduced by trapping air in the fibers and particles of the insulation and stopping the air movement. Air that is motionless is a good insulator because it does not conduct heat well. Moving air results in convective heat transfer, which can be very effective in transferring heat. Wind chill is an example of increased convective heat transfer due to air movement. A winter coat reduces convective and conductive heat loss in the same way conventional insulation reduces heat losses in a building.

Reflective foil insulations work by reducing radiant heat exchange. Radiant heat is transferred without using air or a solid to conduct the energy. You feel radiant heat exchange when sitting in front of a open fire. The heat transfer to you can be stopped by shading yourself with a solid object. Foil insulations are used to block the radiant heat and can not be rated with a R value because they do not work in the same manner as conductive insulations.

Reflective foil insulations are most effective when large temperature differences occur or where convective and conductive heat transfer is minimal. They can often be found inside engine compartments where manifold temperatures can reach 1,200F and outer space applications where air is not present for convective heat transfer.

In traditional poultry housing, reflective foils are best used when added to conventional insulations. The addition helps to reduce the overall heat loss or gain. For example, foils have been placed over existing insulation in attics to reduce the heat gain in summer. These applications have been used with success in Southern climates where extreme temperatures can occur.

The use of adequate amounts of conventional insulations will keep the walls and ceilings of a poultry house cooler in summer and warmer in winter than reflective foil insulations alone. The addition of a radiant barrier can help the overall performance of the insulation system. However, conclusive results are not available for their cost effective use in Pennsylvania.

Fiberglass and other conventional insulations have been widely used because their cost per R values has been reasonable. Recommendations for insulation levels in Pennsylvania are R-20 in the walls and R-33 in the ceiling. These values are based on typical costs of conventional insulations and operating temperatures.