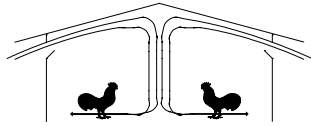




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Poultry Housing Tips

Small Curtain Opening vs. Adjustable Air Inlets

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Maintaining good air quality without getting a large fuel bill at the end of the month is a challenge all broiler and pullet growers face during the winter months. It seems growers have two options; they can increase the timer settings on their minimum ventilation fans and have good air quality with a high fuel cost, or reduce timer fan settings and have poor air quality with a low fuel cost. There just doesn't seem to be a way to have both a good environment and low fuel bills.

The key to solving this dilemma is to realize that the cost of heating a house is determined not only by how much fresh air is brought into the house but also how the fresh air is brought into the house. In fact, at times the way the cold air enters into a house can be more important in keeping heating costs to a minimum than how much air is brought in. For instance, if outside air is drawn in through adjustable inlets and directed toward the ceiling, it will mix with the warm air near the ceiling. In addition, it will push warm air near the ceiling down toward the birds, thereby minimizing heating costs. But, if outside air is drawn in through a cracked curtain, the air will shoot down towards the floor chilling the birds and turning on furnaces and brooders (Figures 1 and 3.) (*Poultry Housing Tips, Negative Pressure Ventilation - Air Inlets, December 1992*).

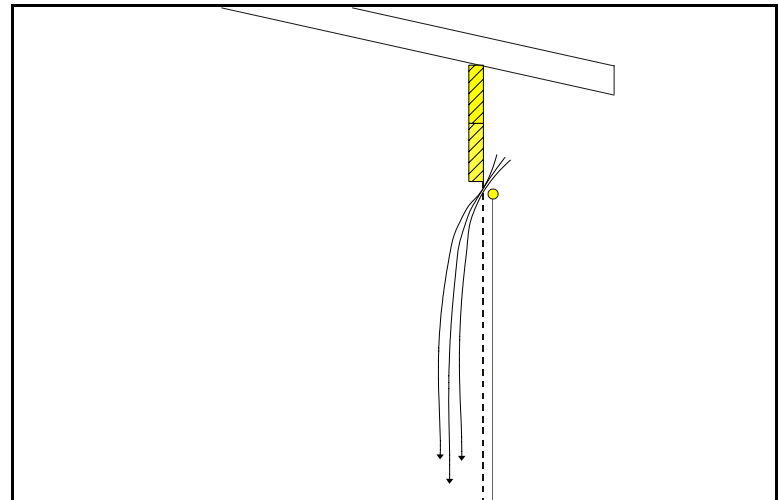


Figure 1. Air Entering Through a Small Curtain Opening

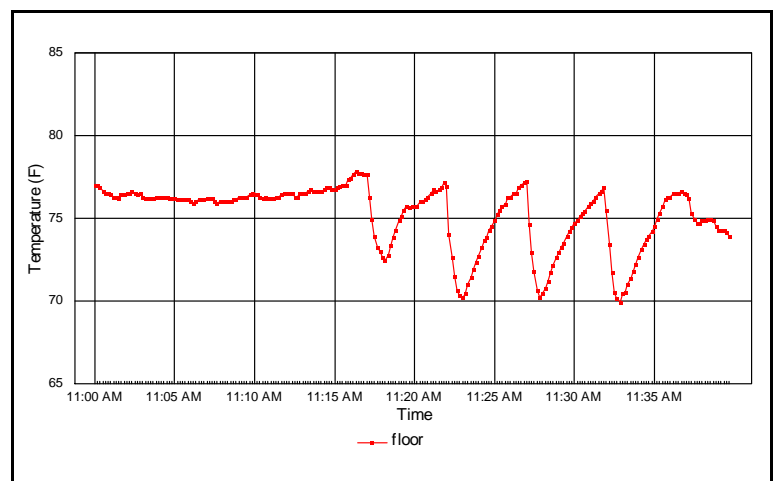


Figure 2. Air temperature next to feed line.

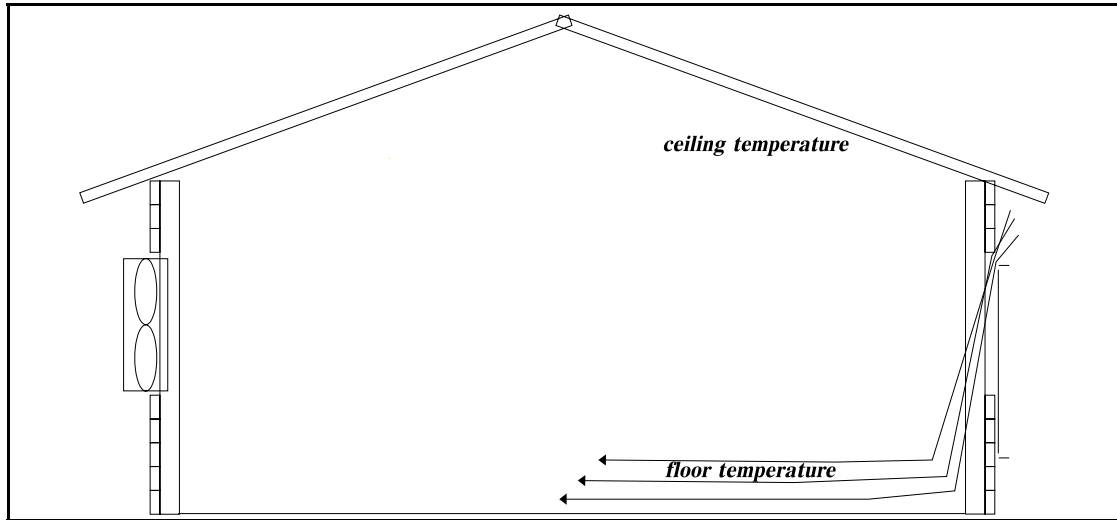


Figure 3. Air flow with small curtain opening

Figure 2 provides a dramatic illustration of the difference in floor air temperature comparing adjustable inlets and cracking a side wall curtain. The temperature recordings were taken in a 500' broiler house with two 36" fans and one 48" fan on a timer operating two minutes out of five. Floor air temperature was measured next to the feed line one foot above the floor. Ceiling air temperature was measured 6" off the ceiling. The birds were four weeks of age and the outside temperature was approximately 45°F. Between 11 a.m. and 11:15 a.m. fresh air was drawn into the house by timer fans through adjustable side wall air inlets. At 11:15 a.m. the inlets were closed, and the curtain opposite the exhaust fans was lowered to create a one inch curtain crack.

When the adjustable side wall inlets were used the floor temperature remained relatively constant. This is because the cold air was directed along the ceiling. Figure 4 shows the heat accumulating at the ceiling between timer fan cycles when adjustable side wall inlets were used. When the fans came on this warm air was pushed toward the floor.

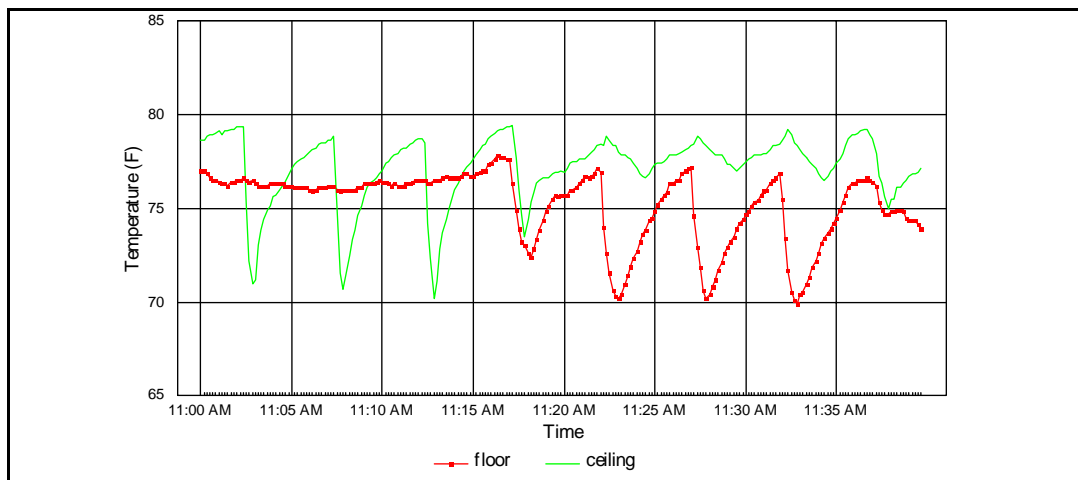


Figure 4. Floor and Ceiling Air Temperature.

When the curtain crack was used as an air inlet, the floor air temperature varied approximately eight degrees during each timer cycle. The variation in air temperature air was caused by the air entering the vertical opening formed by

the cracked curtain. Every time the fans come on the cold air rushes toward the floor with minimal preheating. The warm air near the ceiling is not utilized. If outside temperature was lower or the fans stayed on longer, the variation would have been even larger.

It is apparent that if a furnace or brooder thermostat was set at 70°F and a cracked curtain was used as an air inlet, the furnace or brooder would have probably come on every time the exhaust fans ran. This of course would result in the worst possible combination - high fuel bills and cold birds. When adjustable air inlets are used, the introduction of fresh air has minimal effect on house air temperature and therefore minimal effect on heating costs.

It is important to keep in mind that even if you use adjustable side wall inlets, you can experience the same type of floor temperature fluctuations if the side wall curtains do not seal properly. This is why it is so critical that the side wall curtain has enough overlap to seal tightly against the side wall.

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