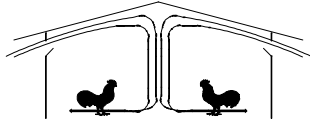




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Poultry Housing Tips

Obtaining Uniform Air Inlet Openings

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In a negative pressure ventilation system, exhaust fans draw fresh air into the house as well as exhaust stale air from the house. Side wall inlets help to distribute fresh air throughout the house as well as to direct the incoming cold air toward the ceiling and away from the birds. As the cold incoming fresh air moves along the ceiling it mixes with the warm air produced by birds/brooders which “dries it out” before the air moves toward the floor and over the birds.



Figure 1. Ceiling inlet with steel banding strip



Figure 2. Inlet attached to steel banding strip

It is important to note that in a negative pressure ventilation system, air is drawn in uniformly through all air inlets no matter how far they are from an exhaust fan. Therefore, the same amount of air will enter an inlet ten feet from an exhaust fan as from an inlet 500' from an exhaust fan. Since air enters through all the side wall inlets the same, air quality and temperature uniformity are determined by how far a bird is from an air inlet not how far a bird is from an exhaust fan. If the inlets are placed uniformly along the length of a house and they open a uniform amount, uniform house conditions can be maintained. Figure 3 illustrates uniform house conditions which were achieved in a 500' broiler house using 48" fans located in one end wall for ventilation in which all the side wall inlets opened uniformly.

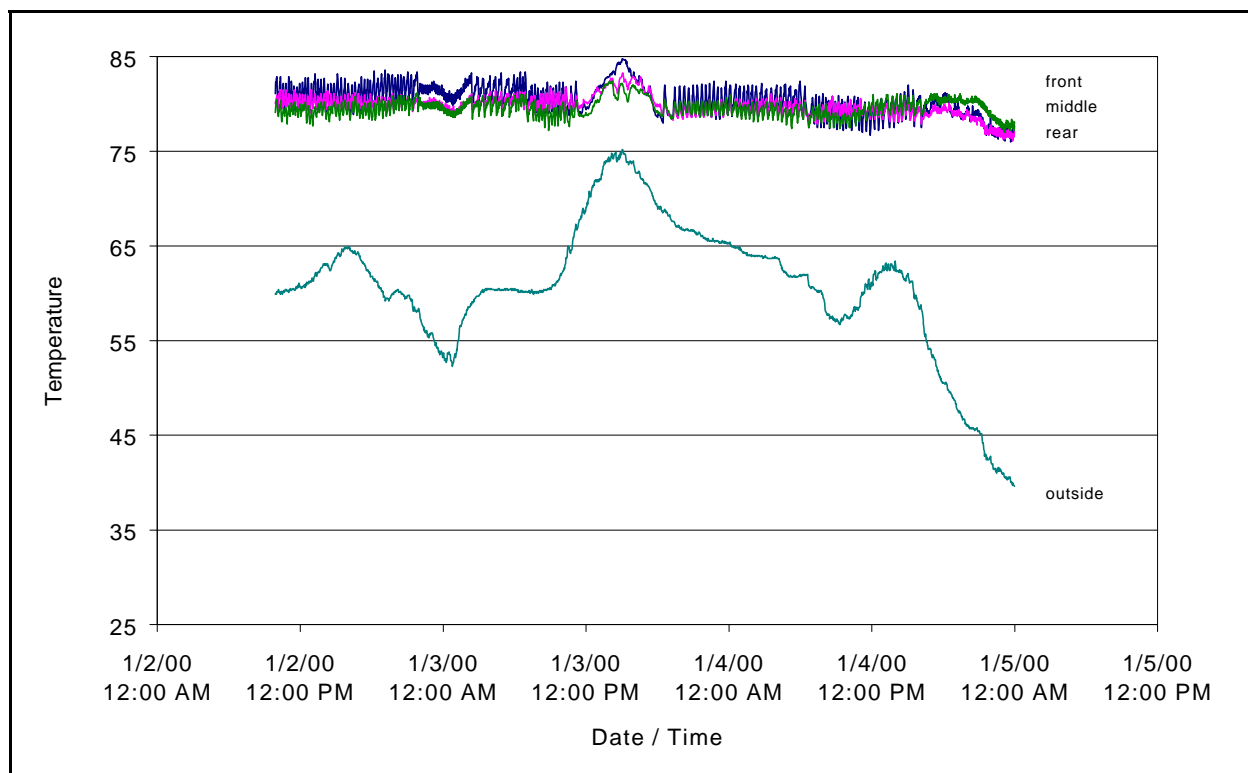


Figure 3. Uniform broiler house air temperatures

Now, of course the fact that the same amount of fresh air comes in each inlet in a house only holds true if all the inlets are opened the same amount. If the inlets at one end of the house are opened twice the amount as the inlets on the opposite end of the house, the birds on one end of the house will receive twice the fresh air as those on the other end. As a result, it is possible to end up with a situation where the air on one end of a house is too cold because the inlets are opened too much, while the air at the opposite end of the house is warm and stuffy because the inlets are not opened enough. This is why it is so important that all the side wall inlets are adjusted to open uniformly.

In many broiler houses an inlet machine is used to control the opening and closing of side wall inlets. An inlet machine makes sure that enough negative pressure is maintained when the exhaust fans are operating as to create effective air mixing but not too much as to cause fan performance problems. Since the inlet machine controls the amount the inlets open throughout a house, large differences in house air temperature and quality can result if the inlet machine is not installed properly.

In order for an inlet machine to open the side wall inlets, there must be minimal stretch and sag in the cables which run the length of the house and are responsible for opening and closing the inlets. When the cables stretch and sag, the inlets nearest the inlet machine will open significantly more than those at the opposite end of the house. The greater the amount of stretch and sag, the greater the difference in inlet opening between the inlets nearest the inlet

machine and those at the opposite end of the house.

Figure 4 illustrates what happens when inlet machine cable stretches and the inlets near the machine (rear of the house) open more than those on the opposite side of the house (front of the house). As you can see the rear of the house, where the inlets have opened more, is always a few degrees cooler than the front and middle of the house. Since the rear of the house is colder the furnaces in this area come on more than they should, while at the front of the house the air is relatively stuffy which could lead to health issues.

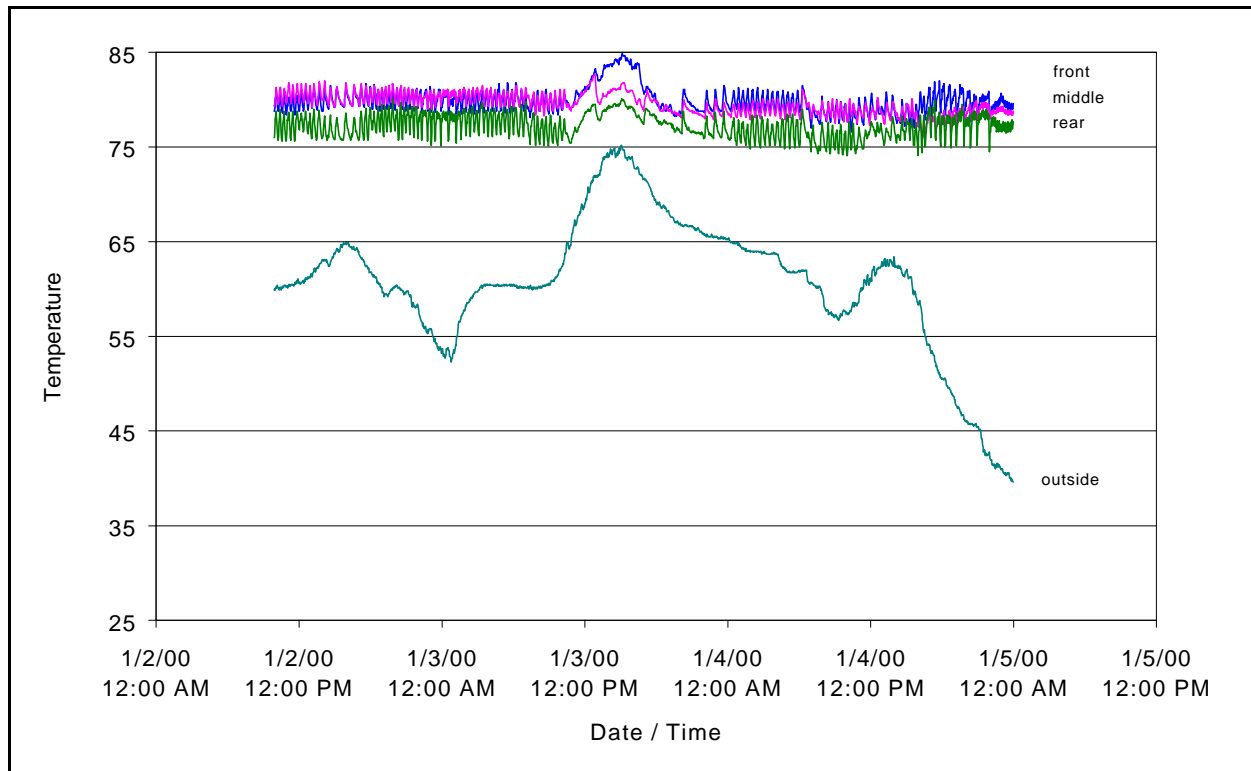



Figure 4. Cool air temperatures on tunnel fan end of broiler house

The reason that the inlets open more uniformly in the house in Figure 3 is that steel banding strip is being used instead of cable to open and close the inlets (Steel banding strip is eight foot long sections of 1/2" wide galvanized sheet metal bolted together). In addition to the fact that the banding strip does not stretch, it does not twist. Thus the strings from the inlets do not get wrapped around the strip steel like they do around cable which often leads to nonuniform inlet openings. Though it is true that cable stretch can be minimized by significantly increasing the amount of weight or spring tension placed on the inlet cable, this sometimes leads to cable breakage problems.

If you do not have access to banding strip, you may want to consider using threaded steel rod or at a minimum, high tensile fence wire. Though these options may cost more, in the long run they will pay for themselves in reduced fuel usage, improved bird performance, and most importantly, reduced maintenance.



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