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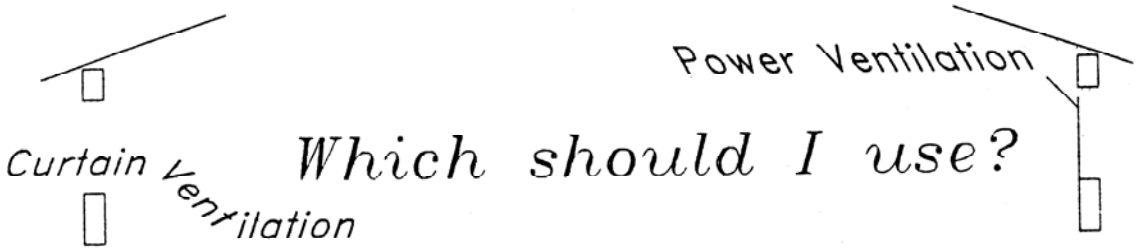

Which should I use?

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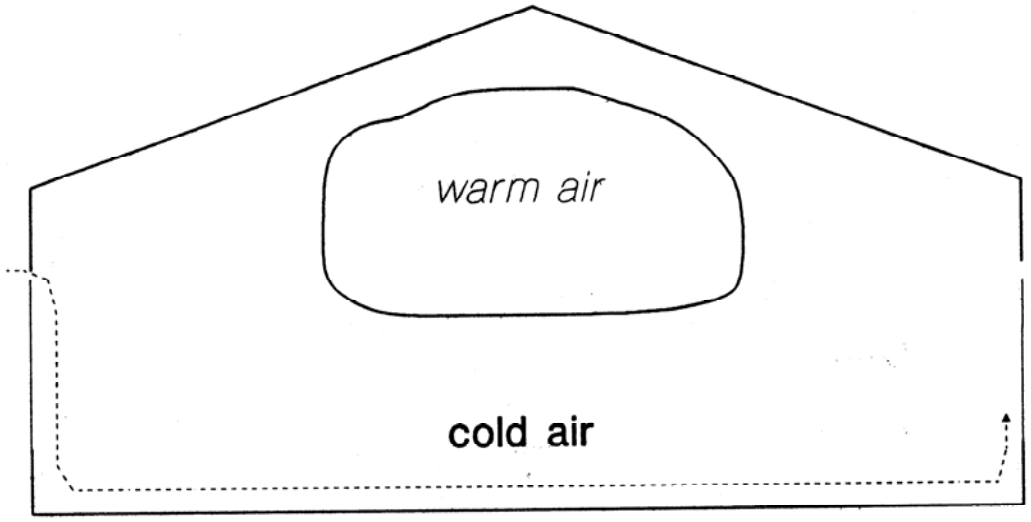
Most curtain-sided broiler houses have two ventilation systems: exhaust fans and sidewall curtains. Most people don't really think of them as being separate systems. But, upon closer examination of how they operate, it becomes apparent how different they really are. For the most part, exhaust fans are designed to be used when outside temperature is below the desired inside temperature, or to put it another way, when a grower is concerned about conserving heat. Sidewall curtains, on the other hand, are designed for use when outside conditions are close to what you would like inside conditions to be. Basically, they allow a large amount of outside air to flow through the house ridding it of excess bird heat. If used correctly, the two systems can help a producer provide the optimum growing environment throughout the year.

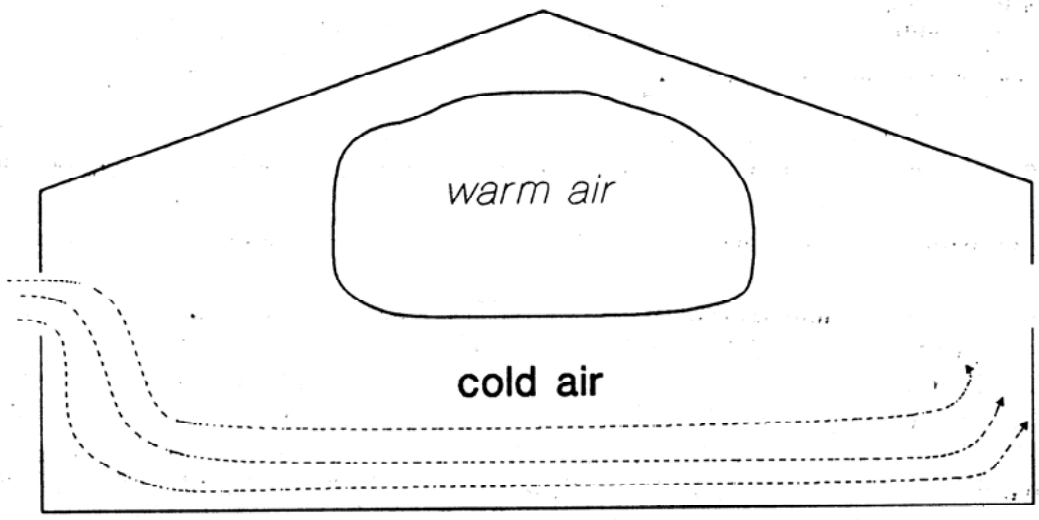
Curtain Ventilation:

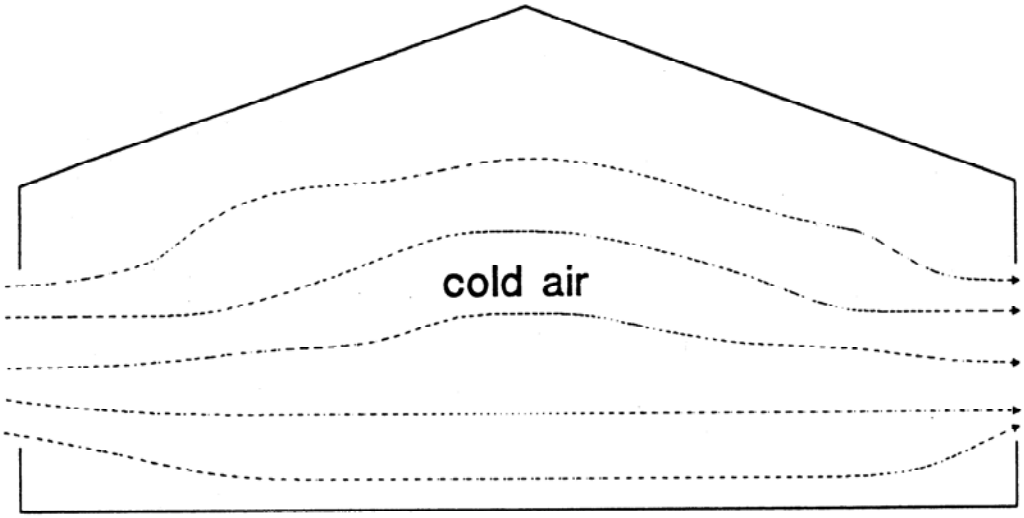
The key to proper environmental control is to select the proper method of ventilation according to outside conditions and bird age. Many problems faced by growers during the winter months are related to the use of curtains instead of exhaust fans for ventilation. Since the curtains are designed to make inside conditions like outside conditions, it will tend to become cold inside when it is cold outside. Though this happens more quickly when the curtains are all the way down, it still tends to happen even with a relatively small curtain opening. With just a slight breeze (5 mph) and a two inch opening approximately 30,000 cubic feet of air will enter a house in one minute. This is the same as running three 36" exhaust fans. When it is relatively warm outside it's not really that important exactly how much air enters the house. But, when it is 30 degrees outside and your birds are a few weeks old, it's doubtful you would like to have three exhaust fans running continuously.

A second factor to consider when choosing between curtains and exhaust fans is that when it comes to ventilating a poultry house, the way air is brought in is just as important as the amount of air brought in. During the winter, cold outside air is much heavier than the warm inside air (hot air rises, cold air falls). When cold air drifts through a curtain opening it quickly drops to the floor. The cold air chills the birds which leads to poor bird performance as well as increased susceptibility to disease. Furthermore, since the cold drafty air has very little moisture holding ability it does not remove any moisture from the litter which leads to litter caking.

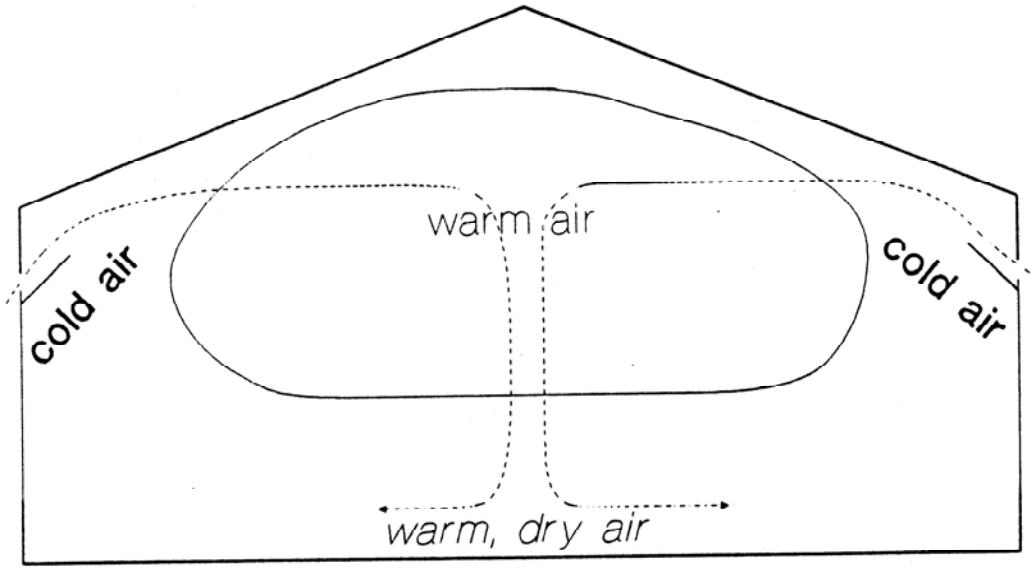


It is important to emphasize that during cold weather, curtain ventilation tends to remove the warm air next to the floor first. With a small curtain opening the warm air right next to the floor is displaced by colder air. As the curtain opening increases more and more warm air near the floor is displaced and blown out of the house. For instance, with a 1" curtain opening the warm air within a few inches of the floor is removed. When the curtain opening is increased to 6" all the warm air within a couple of feet of the floor may be displaced. When the curtains are wide open practically all the warm air is removed from the building.





Power Ventilation:
Exhaust fans are designed to pull a specific amount of air into the house with force. Instead of air just drifting into a house, exhaust fans draw small amounts of air in with a little bit of speed to promote a better mixing of the cold outside air with the warm air above the birds. Since the air is essentially being thrown into the house, it doesn't immediately fall to the floor. During the time it is shooting into the house it is warming up. Every second the air can be kept aloft, it heats up, increasing its moisture holding ability. The air gradually changes from being a cheap paper towel to a super absorbent paper towel. By the time it does drop to the floor the increased temperature and absorbency of the air aids in keeping the birds free from drafts and in keeping the litter dry.



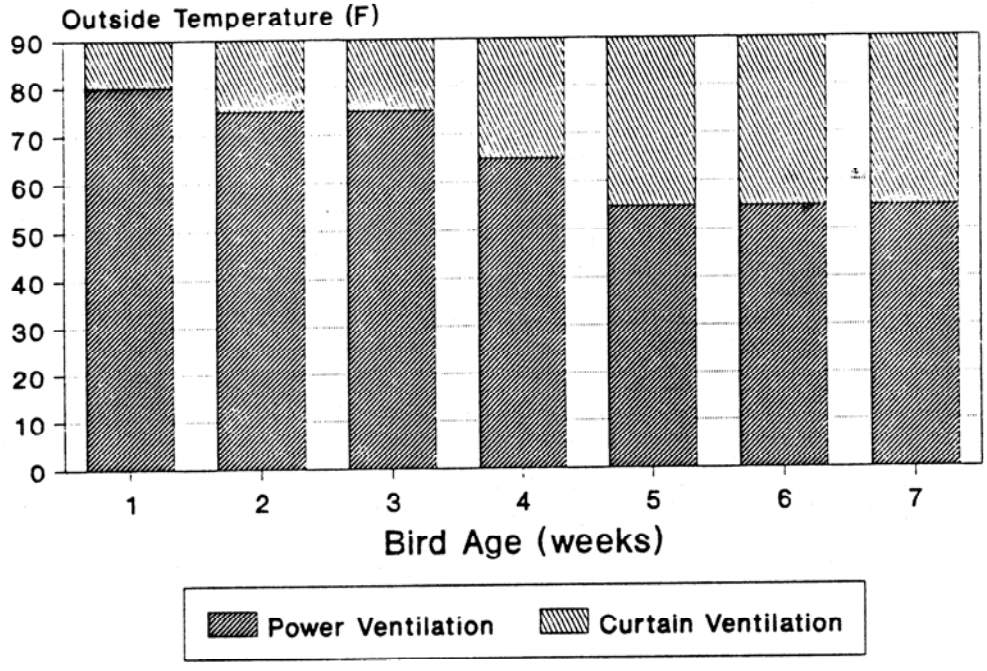
In order for power ventilation to operate properly, it is important that the amount of opening available to draw air in from is matched with the number of exhaust fans running. Too much opening will not allow the air to be drawn in with sufficient velocity to promote good mixing. Too little opening will prohibit the fans from pulling enough air into the house. For each 36" exhaust fan approximately 15 to 20 square feet of opening is required. This may seem to be a lot until you realize that a single 1" curtain crack just in the brooding area of a house is more than 16 square feet.

Most poultry houses (even brand new ones) have at least 15 to 30 square feet of cracks. Tightness of the house decreases with age. The net result is that if the curtain is dropped an inch or so there is too much opening to allow the fans to draw air in with sufficient speed to make it to the middle of the building. The air drops to the floor a few feet from the sidewall somewhat warmer and dryer than it was when it entered the house, but not warm and dry enough to prevent the chilling of the birds or to promote litter drying.

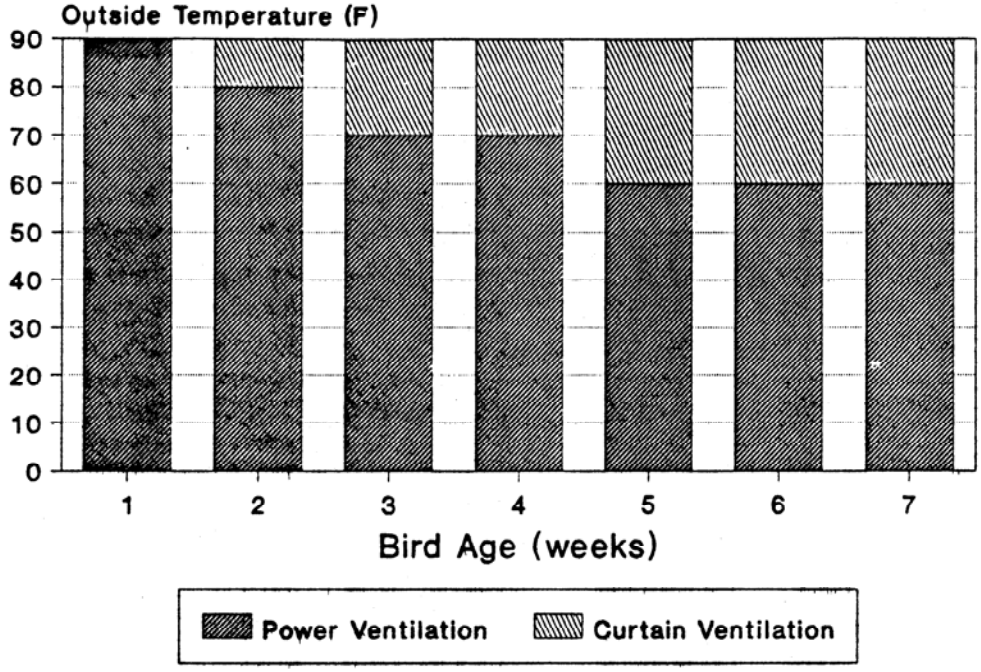
To avoid this problem inlets can be used to both limit the amount of opening the fans can draw air through and to direct the air entering the house away from the birds. Inlets don't have to be anything complicated. Just a small rectangular hole in the wall with a board across it to direct the cold air toward the ceiling is all that is necessary. The number of inlets required depends on the number of fans a house has and the size of each inlet. In general, as mentioned above, about 15 to 20 square feet of inlet area is required for each 36" exhaust fan (30 to 40 ft^2 for a 48" fan).

It is generally recommended that a house have a minimum of one 36" exhaust fan for every 100' of house length. This should allow most houses to be ventilated during cold weather (55°F and below). If it is desired to be able to power ventilate a house during more moderate weather (65°F and below), one and a half 36" exhaust fans are required for each 100' of building length.

When to use each system:
When is it too cold to use curtains for ventilation? In general it is best not to curtain ventilate when it is 15 degrees cooler outside than what you would like it to be inside. With smaller birds, which put off less heat and are more susceptible to drafts, a 10 degree temperature



difference should be the rule of thumb. The preceding chart is a general guide indicating when it is best to power ventilate and when curtain ventilation can be used without much problem according to bird age and outside temperature. The temperature used on the chart is the expected low temperature that day.



To provide optimum conditions when curtain ventilating it is advantageous to have a curtain machine. A curtain machine can make continual adjustments to the curtain opening, reducing the possibility of the birds getting too cold or hot due to changing outside temperature and wind conditions. If someone is going to be on the farm all the time, it is possible to get by without one. But, it will mean that someone may have to check the houses a few times during the night to insure optimum growing conditions.

It is important to realize that the above chart is intended to be a guide as to the lowest temperature allowable to avoid potential production problems. The ultimate goal in ventilation is to control the environment in such a way as to maintain the best possible conditions at all times. In general, power ventilation is the best way to achieve this goal. Therefore, In order to fine tune production efficiency you may want to delay using the curtains until it gets even warmer outside. The chart on the following page indicates the selection of curtain or fan ventilation based on a desire for even tighter control. You may find that in order to properly ventilate according to this chart one and a half 36" fans may be required for each 100' of house length as mentioned previously.

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