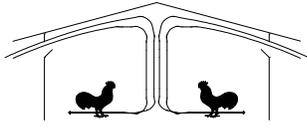




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Poultry Housing Tips

Basic Attic Inlet Operational Guidelines

Volume 19 Number 13

December, 2007

Balancing air/litter quality with propane usage during cold weather has always been a challenge for poultry producers. But now, with the price of propane climbing to over two dollars a gallon, what before was a challenge, for many now seems to be nearly impossible. Attic inlets are looked upon by many as a possible partial solution to this dilemma. Though attic inlets do have the potential to decrease the cost of heating a poultry house, their most significant impact has been that by pulling 5°F to 30°F warmer air out of the attic during the day, poultry producers are able to ventilate their houses 20% to 100% more without **increasing** heating costs. The higher daytime ventilation rates have significantly improved both house air and litter quality.

Though there is still a number of questions as to the best way to use attic inlets, the following are some operational guidelines to consider. These guidelines have been developed to help users of attic inlets to take full advantage of the warm air in their attics.

Basic Attic Inlet Operational Guidelines

Ideally, houses equipped with attic inlets should have an attic temperature sensor. This can either be a spare temperature sensor from a house's environmental controller or a stand alone thermometer such as a digital thermometer with an external temperature sensor which can be placed in the attic (i.e. Radioshack #63-1087). An attic temperature sensor allows the producer/controller to know how warm the air is in the attic so adjustments can be made to minimum ventilation fan settings to take full advantage of the warmer attic air.

Between flocks:

Close up the house except for the attic inlets. Set three 36" fans or a 48" and a 36" fan on a timer operating a few minutes out of 30 minutes. Any other fans should be turned off as well as the side wall inlet machine. When the attic temperature reaches a minimum of 60°F the fans should run continuously. If there is a controller temperature sensor in the attic this can be done automatically by setting the timer fans to operate off of the attic temperature instead of house temperature and setting the controller to maintain a temperature of 60°F. Using the attic inlets between flocks will pull warm air to the house during the day which should help to "burn-off" some ammonia as well as help to remove moisture from the litter.

Prior to chick placement:

- 1) During cold weather it is generally best to close the attic inlets on the nonbrooding end (if you want to leave open one or two for moisture control on the nonbrooding ends that is also permissible). Keep in mind that though during the day the attic air is warmer than outside air, at night there is little to no difference between outside and attic air temperature. So if it is 30°F at night you will be pulling 30°F air into the nonbrooding end of the house every time the minimum ventilation fans operate.

PUTTING KNOWLEDGE TO WORK

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- 2) Set side wall inlet controller to maintain a static pressure between 0.09" and 0.12". This will generally keep the side wall inlets closed during minimum ventilation and allow all the fresh air brought in by the minimum ventilation fans to enter the house through the attic inlets. Make sure the side wall inlet machine is set to operate if the static pressure rises above 0.12" so that if the house heats up too much, and additional fans do come on, the side wall inlets will open to meet the needs of the additional fans.
- 3) Set one 36" fan on the brooding end and one 36" on the nonbrooding end to operate as your minimum ventilation timer fans.
- 4) Turn on the two 36" fans manually and check the static pressure. Typically it will run between 0.05" and 0.10". If it is lower than 0.05", your house needs to be tightened and/or you may need to use three 36" fans for minimum ventilation. It is important to realize that with attic inlets it is not always necessary to have as high of a static pressure as one might typically target in a house with side wall inlets. First, we don't have to throw the incoming air all the way to the center of the house to hopefully mix with the warmest air near the peak of the ceiling because it is already there. Secondly, due to fact that the attic inlet sits on the ceiling and is designed to direct air along the ceiling, you will often find that a relatively low static pressure will do a good job of mixing of the cool incoming air with the hot air near the ceiling. Last but not least, for a good portion of the day the attic air is warmer/lighter than outside air and therefore a slightly lower static pressure and the resulting lower inlet air velocity are not problematic. The net result is that you will tend to find that attic inlets function very well at a static pressures as low as 0.05" or 0.06".

After chick placement:

- 1) Set your timer fans as you have in the past. Monitor house relative humidity. The ideal relative humidity is around 50%. If the relative humidity is above 70%, timer fan settings should be increased to avoid litter moisture problems.
- 2) Monitor attic temperature. When the attic temperature rises above 70°F, consider increasing minimum ventilation fan runtime 50% or more. If the attic temperature rises to 80°F+ consider increasing runtime by 100% or more. If the attic temperature rises to 90°F+ runtime should be increased 200% or more. It is important to realize that if you don't increase your minimum ventilation rates during the day you may not pull enough warm air out of the attic to make a difference in house conditions. What you will often find is that by increasing the minimum ventilation fan run time during the day, you will pull enough warm air out of the attic to cause the minimum ventilation fans to operate constantly, which will result in significantly improved air and litter quality. At night, minimum ventilation fan settings can be reduced back to what they were in the morning, keeping in mind that the ideal relative humidity is around 50% (70% maximum).
- 3) If the house warms up enough that additional fans (other than your timer fans) come on and the static pressure rises above 0.12", the side wall inlets should open automatically. If you feel you are pulling too much warm air from the attic, just decrease the static pressure setting on your side wall inlet machine (typically only an issue during warmer weather). The lower static pressure setting will cause the side wall attic inlets to open more and less air will enter through the attic inlets, lowering the house warming effect produced by the attic inlets.
- 4) Some environmental controllers have the ability to change the side wall inlet machine's static pressure setting with house temperature. This can be a useful method of reducing the effect of the attic inlets if you feel the house is getting a little too warm. For instance, if a 48" fan turns on and the side wall inlets begin to open, you can set the environmental controller to decrease the side wall inlet static pressure setting from a 0.06 to 0.09". This will not only reduce the effect of the attic inlets but typically cause the side wall inlets to open enough (an inch or more) to get the air to the center of the house.

Turning the birds out into the entire house:

- 1) You may want to consider switching to a 48" fan for minimum ventilation to help pull the warm air from the brooding end into the nonbrooding end of the house.
- 2) As the birds spread to the nonbrooding end, open the attic inlets on the nonbrooding end. Generally an additional 36" fan will be required once all the attic inlets are opened to be able to maintain a static pressure of at least 0.05".

Full house operation:

- 1) Consider decreasing the temperature offset of your minimum ventilation fans to one degree above your target temperature. The lower temperature offset will tend to cause the minimum ventilation fans to switch to constant operation earlier in the day, thus taking greater advantage of the warmer attic air to help dry out the house.
- 2) Don't worry if the attic inlets are causing the house to run a degree or two warmer. Watch your birds. Do they look like they are too warm? Most of the time the slightly higher house temperatures produced by the attic inlets will just cause another fan or two to operate and the cooling effect produced by the additional air movement will tend to offset the slightly higher house temperatures.
- 3) Don't be concerned if the house humidity drops well below 50% during the day. The lower humidity will not harm the birds and will lead to accelerated moisture removal from the litter, which in turn will often lead to lower house relative humidity and improved air quality at night.
- 4) Some environmental controllers have the ability to increase minimum ventilation settings based off a single or group of temperature sensors. Using an attic temperature sensor by itself or in combination with inside house temperature sensors can at times help increase minimum ventilation fan runtime. Caution should be used when using attic temperature to control minimum ventilation fan settings. For instance, some controllers can be programmed to use a temperature sensor to automatically increase timer fan settings if the temperature indicated by the sensor rises above the desired house temperature. So, if during the day it is 40°F outside and 65°F in the attic, the controller would not increase minimum ventilation fan settings if the desired temperature was 75°F, even though doing so would help to improve air quality and not necessarily result in increased fuel usage.
- 5) Don't worry about the attic inlets causing a significant increase in electricity usage. Even if the attic inlets caused a 48" fan to run for an additional six hours a day, this would typically increase electricity usage by less than \$0.50 per day.
- 6) When walking your houses, always be on the lookout for side and end wall leakage. The tighter you make your house, the greater the percentage of the air that will enter through the attic inlets, and the better job the attic inlets will do at keeping your litter dry and your air fresh.
- 7) Don't feel you have to close the attic inlets if you happen to have a warm day or two and the house goes into tunnel ventilation. At lower levels of tunnel ventilation that one may experience during the cooler times of year, the static pressure will tend to be very low (less than 0.05"). The low static pressure will cause the attic inlets to close all or most of the way, thereby limiting their effect (keep in mind that the static pressure has to exceed 0.04" for the attic inlets to even open). Even if they remain open when tunneling, the hot air they do introduce will be relatively minimal when compared to the amount of air entering through the tunnel curtain and will tend to stay next to the ceiling, resulting in a minimum effect on house temperature (a degree or less)



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