



# The University of Georgia

College of Agricultural and Environmental Sciences  
*Cooperative Extension*



## *Poultry Housing Tips*

### *Attic Inlet Operation Guidelines*

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When it comes to operating any air inlet system during the cooler times of the year it is important to keep in mind that our primary objective is to maximize the amount of fresh air we bring in without causing excessive decreases in air temperature or excessive increases in fuel usage. Quite simply, the more air we can bring in without decreasing house temperature, the fresher the air will be, and the better our birds will perform. For instance, let's say you have older birds and four 36" fans are operating because the house is a degree or so above the target temperature. You could set your controller to maintain a low static pressure (0.03"), which would cause the inlets to open wide, the cool outside air would quickly drop to the floor, house temperature would quickly decrease, resulting in the fans turning off. Though this may reduce your electricity bill a few pennies, would it be best for the birds? A better option would be to maintain a higher static pressure (i.e., 0.08") which would reduce the inlet opening and help directing the cool incoming air to move across the ceiling. As the air moves across the ceiling it would mix with the warm air produced by the birds, heat up and then upon reaching the center of the house, gently move towards the floor. The air temperature at bird level might stay the same or possibly increase which could cause additional fans to come on, resulting in even better air quality. Again, the goal is not to reduce fan runtime/electricity usage, but rather maximize the amount of time fans operate so we can maximize air quality and bird health.

It is very important to keep this concept in mind when operating attic inlets. Though attic inlets can lead to slightly lower heating costs, the primary objective of an attic system is to maximize fan runtime which will lead to improved air quality and litter conditions. Attic inlets tend to do a better job of conserving heat in a poultry house than conventional side wall inlets. First, fresh air is introduced at the peak of the warm air produced by the heating system and birds tends to collect. Second, air entering through an attic inlet moves parallel to the ceiling and not parallel to the side wall which tends to maximize the distance the air travels along the ceiling (Figures 2 and 3). The longer the air travels along the ceiling the more it will heat

up and dry out. Last but not least, during the daylight hours, drawing heated air out of the attic at a minimum reduces house cooling and sometimes leads to increased house temperatures causing more fans to operate. The combination of all these factors has been shown to increase the amount of air brought into a house by 20% or more compared to a house using side wall inlets.

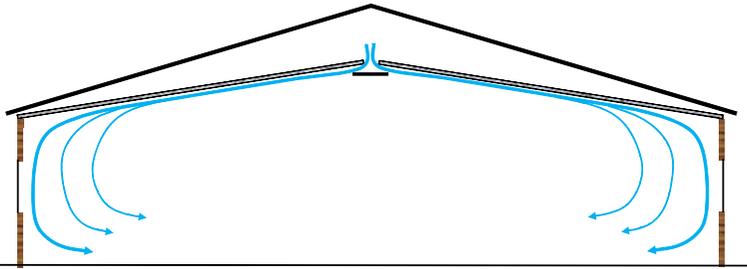


Figure 2. Air flow pattern from an attic inlet.

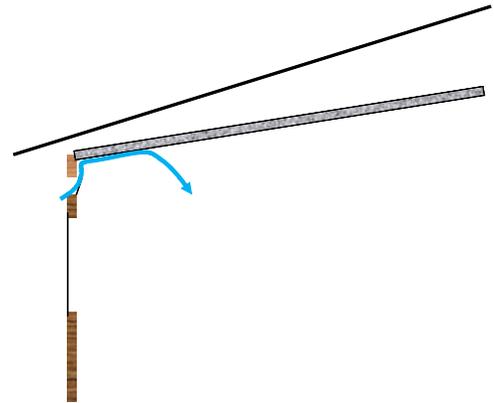
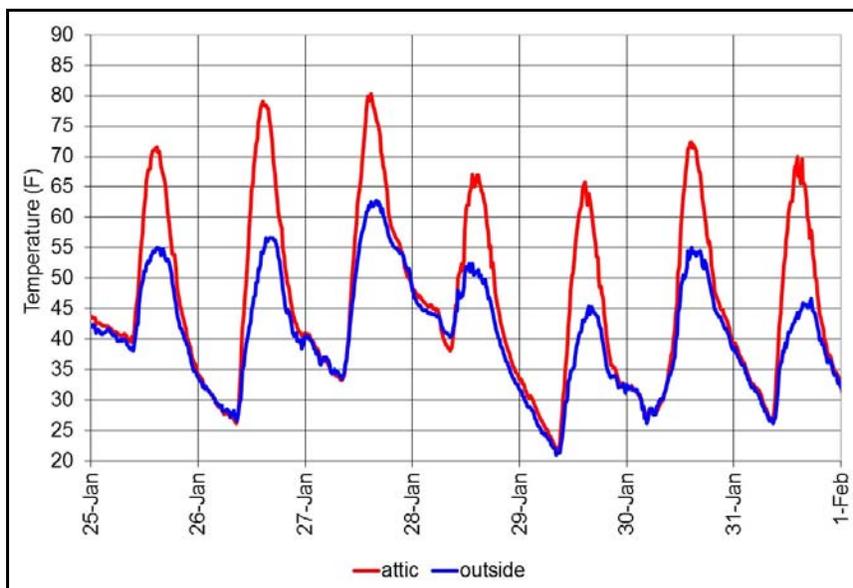


Figure 3. Air flow pattern from a small side wall inlet opening.

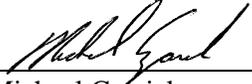
As with any relatively new concept, there is often a fair amount of confusion as to how to best operate attic inlets. Though it is impossible to come up with a single best way to operate attic inlets, the following are a few simple rules to keep in mind when trying to get the most out of your attic inlet system.

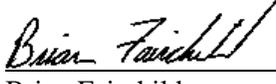
- 1) Attic inlets should open at most three inches...ideally one or two. During cold weather, the smaller the air jet coming from an air inlet, the quicker the incoming air heats up, and the lower the probability that the incoming air will decrease house temperature or cause a draft. Larger inlet openings can lead to drafty side walls and uneven house temperatures.
- 2) Attic inlets should generally be operated at a lower static pressure than traditional side wall inlets. There are a number of reasons for this. First, attic inlets are better designed to throw the cool incoming air farther than most side wall inlets at a lower pressure. Second, an attic inlet is not fighting gravity. Side wall inlets have to throw the heavy cold incoming air “uphill” whereas with an attic inlet, gravity works with the air jet to get the air to the side wall. Last but not least, the air entering through an attic inlet is already where we want it, namely near the peak of the ceiling where hot air generally collects.
- 3) Because attic inlets do not generally require a high static pressure or a large opening, you can use fewer timer fans, operating for a longer period of time, and still obtain proper air mixing and distribution. Operating fewer minimum ventilation fans over a longer period of time leads to more stable house temperatures and air quality. For instance, it is generally better to operate two 36" fans on a timer for one minute out of five than four fans 30 seconds out of five. Though in both cases we are bringing in the same amount of air, operating four 36" fans in a typical house results in exchanging 20% of the warm inside air with much colder outside air in just 30 seconds, which can cause a fairly drastic change in house temperature and air quality. Operating only two 36" fans for one minute results in a much slower exchange of air which tends to lead to a more stable, and consistent house environment.
- 4) Do not close attic inlets unless the house is in tunnel ventilation mode. There may be days, especially with older birds, that will require more than just a few minimum ventilation fans to maintain proper house temperature. Often producers make the mistake of closing the attic inlets and switch to side wall inlets. This is problematic for a couple of reasons. First, since the outside air is often 10 to 20°F cooler than attic air, the sudden change in incoming air temperature may cause a house to oscillate between side wall inlets and attic inlets similar to what a house may do if switching to tunnel ventilation at too low of an outside temperature. Secondly, the cooler air coming in through side wall inlets will tend to cool the house off more than the warmer air coming in the attic inlets, causing exhaust fans to shut off. But, if the attic inlets are used with the side wall inlets, house temperatures will tend to run slightly higher, which will tend to maximize exhaust fan runtime.

The fact is even if the house were to switch into tunnel ventilation mode during the warmest part of the day, leaving the attic inlets open will not cause any significant issues during the cooler times of the year. Failing to close the attic inlets might cause the house temperature to increase a degree or so when in tunnel ventilation mode which in turn might cause another fan or two to operate but then what is the harm? The additional air moving capacity will make the air fresher and help to remove moisture from the litter with an insignificant increase in electricity usage. Of course during the heat of the summer, attic inlets should be closed when in tunnel mode, but for most of the year an argument could be made that there is more of an advantage to leave them open than a disadvantage.



- 5) On sunny days consider doubling the runtime of minimum ventilation fans in the late morning until late afternoon. Take advantage of the fact that the attic temperatures will commonly be 10 to 20°F above outside air temperature to maximize the amount of fresh air you can bring in without significantly decreasing house temperature. The fact is the more moisture you can pull out of your house, the lower the humidity will be in your house at night. The lower the humidity is at night, the lower your ammonia levels will tend to be at night.
- 6) Use attic inlets throughout the entire flock. Though using attic inlets can be beneficial during brooding, the greatest benefits tend to occur with older birds when exhaust fans often operate during the day in order to control house temperature. By pulling air out of the attic instead of the side walls, exhaust fans are less likely to cool the house, resulting in either fans running longer or additional fans coming on to help bring the house temperature back down. In either case, the longer the fans operate, the better the air quality will be.

  
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