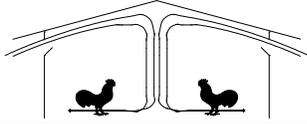




# The University of Georgia Cooperative Extension Service

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## Poultry Housing Tips

### Attic Inlets - Summertime Operation

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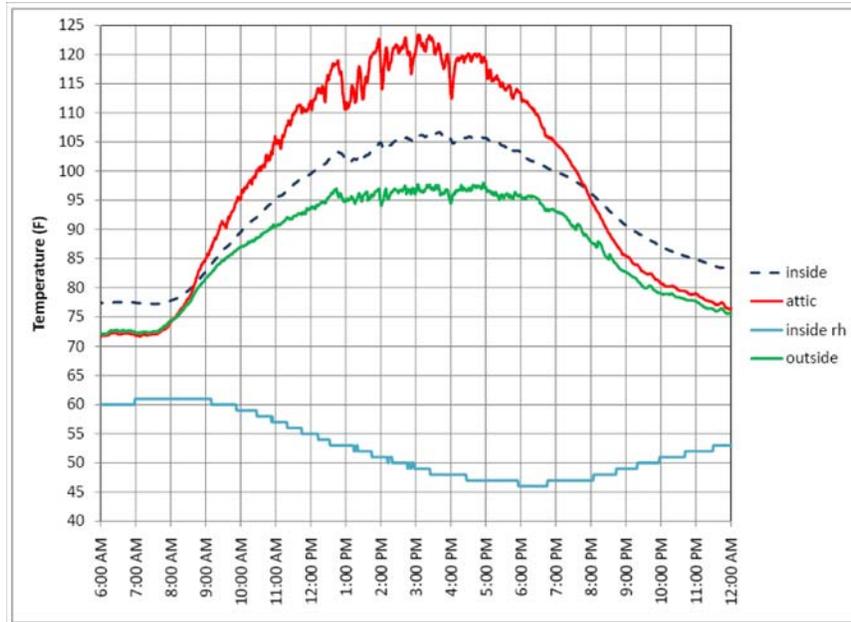


Figure 1. Temperatures in broiler house using attic inlets between flocks on a hot summer day.

Many producers when they first learn of attic inlets think they are something that can only be used during the cooler times of year. There is often concern that if attic inlets are not kept closed during the warmer times of the year they could potentially end up “cooking” the birds in a house. The truth is that there are many benefits of using attic inlets during the warmer times of the year and, that with a couple of simple tricks, a producer will not ever have to worry about their attic inlets harming their birds.

Between flocks, attic inlets can be used to help dry out damp litter as well as to help “cook” off some of the ammonia from the litter. By closing up the house and turning on a couple of 36" fans during the day, attic inlets can increase the house temperatures from 10 to 15 degrees above outside air temperature (Figures 2,3,4,5). Another benefit is not only is the air coming in through the attic inlets warmer than outside air, but it is also drier because as air is heated relative humidity decreases. Ventilating a house with hot, dry air between flocks will help to insure the litter is dry and the ammonia levels are low when the next flock of chicks is placed.

During the summertime, attic inlets can also be used to aid in the preheating process. Since attic inlets can increase house temperature 10 to 15 degrees above outside air temperature, during the day whenever the outside temperature is above 75°F, attic inlets have the potential of increasing the air temperature with a house to near or above proper

### PUTTING KNOWLEDGE TO WORK

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brooding temperatures. Producers may simply choose to turn on their fans on a warm summer day or set their controller to turn on minimum ventilation fans when the attic temperature reaches 100°F.

Figures 2 and 3 are thermal images taken in side by side 50' X 500' houses during the springtime when the outside temperature was in the low sixties. Both houses had a few inches of fresh, damp shavings. The 93°F air coming in through the houses' attic inlets in Figure 3 raised the house temperature to the mid seventies and the floor temperature to nearly 70°F after only a couple of hours of operation. Floor temperatures in the house ventilating through side wall inlets remained in the low sixties, resulting in little litter drying.

Figures 4 and 5 are thermal images taken in side by side 40' X 500' houses on a typical summer day with outside temperatures in the mid eighties. Again both houses had a few inches of fresh, damp shavings. In just a few hours the attic inlets increased the house temperature into the mid nineties and the floor temperature to approximately 90°F. The top surface of the fresh litter was beginning to dry in the house with attic inlets. (The cool "blue" area was the result of brushing away the top surface of litter, exposing the cool damp litter below.)

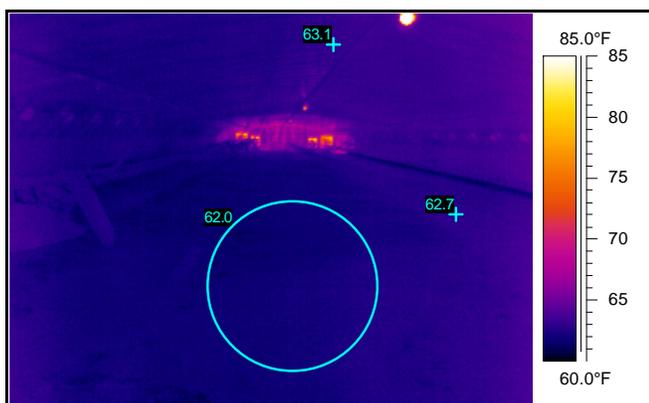


Figure 2. Thermal image of house using side wall inlets between flocks (springtime).



Figure 3. Thermal image of a house using attic inlets between flocks (springtime).



Figure 4. Thermal image of house using side wall inlets between flocks (summertime).

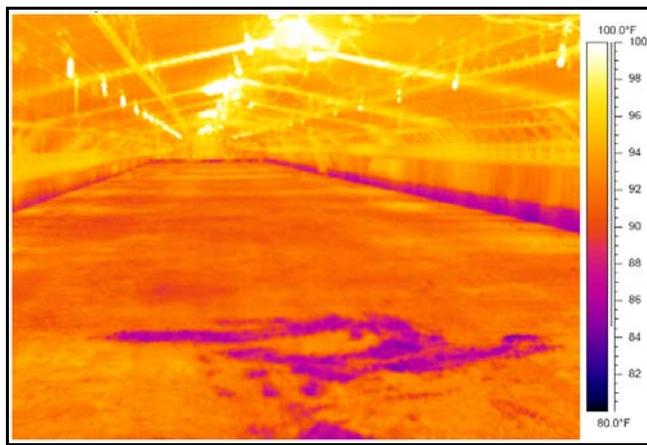


Figure 5. Thermal image of house using attic inlets between flocks (summertime).

What about once the chicks are placed? If attic inlets in the summertime can increase the temperature of the house well above 100°F, won't their use lead to hot chicks? Not necessarily. The key word here is "can." Attic inlets won't lead to house overheating if you simply set the static pressure limits on your side wall inlet machine properly. With a counter-weighted or spring-actuated inlet, as the static pressure in a house is decreased by opening side wall inlets the attic inlets begin to close on their own. Once the static pressure in a house drops below 0.06", the amount of air entering through an attic inlet is typically quite minimal when compared to what is coming in through the side wall inlets. As a result the heating of the house by the hot attic air is reduced if not pretty much eliminated.

For example, Figure 1 shows outside and inside temperatures taken between flocks in a 40' X 500' house with attic inlets. The producer was operating a couple of 36" fans and the sidewall inlet machine was set to maintain a static

pressure of 0.10" to 0.12". This high of a static pressure setting resulted in the side wall inlets remaining closed when just the two fans were operating which maximized the heating of the house with attic air. For approximately seven hours, a house temperature of over 100°F was maintained. Though this did a nice job of preheating the house, it is obviously not what we want when there are birds in the house.

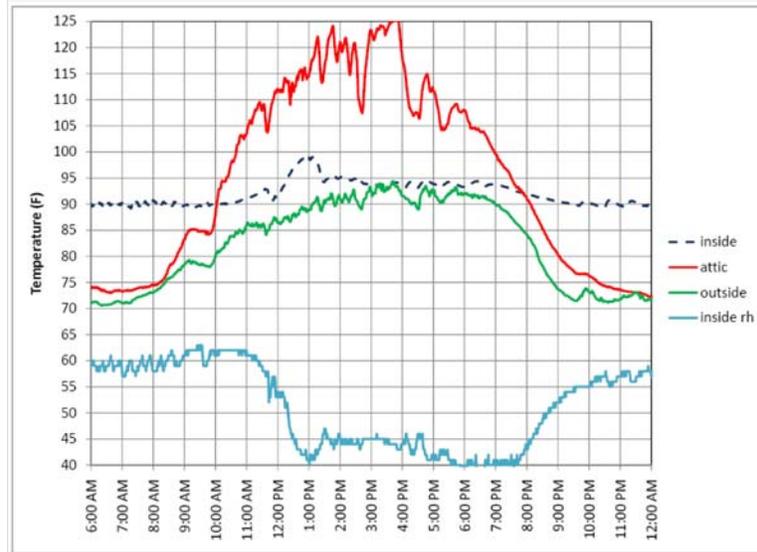


Figure 6. Temperatures in a broiler house using attic inlets during hot weather.

The potential for house overheating was eliminated with a few small changes. Once birds were placed in the house, additional fans were set to come on as the house temperature increased above the set temperature. When a third 36" fan came on, the static pressure increased to approximately 0.10" and attic inlets opened a little more and the heating of the house increased. But, when a fourth fan came on approximately five degrees above the set temperature (1 pm, Figure 6) the controller automatically decreased the static pressure setting on the side wall inlet machine to a minimum of 0.04" and a maximum of 0.06", which resulted in the side wall inlets opening and the attic inlets closing most of the way. The reduction of attic air entering the house in conjunction with the addition of air from fresh air directly from outside, resulted in an immediate decrease in house temperature to 95°F.

It is a very simple, straightforward procedure. The higher the static pressure setting, the greater the amount of air pulled through the attic, the higher the house air temperature. The lower the static pressure setting on your side wall inlet machine, the lower the influence the attic inlets have on house temperature.

Though it is advised that attic inlets be closed during the summertime, after the first couple of weeks it isn't as much of a problem as many think if they are left open, provided the side wall inlet static pressure is set properly. With a low static pressure setting, the amount of air entering through attic inlets will be relatively low in relation to the amount of air entering through the side wall inlets and as a result the heating of the house by the hot air entering through the attic inlets will be minimal. During the initial stages of tunnel ventilation, the static pressure is often low enough that again the amount of air entering through the attic inlets is very low, especially compared to what is coming in through the tunnel opening. But, even when in full tunnel mode and with the attic inlets open, the amount of heating produced by the attic inlets is surprisingly low for a couple of reasons. First, the volume of air entering through the attic inlets is small in proportion to what is entering through the tunnel curtain openings. Second, the hot air entering through a house's attic inlets tends to stay near the ceiling.

Figure 7 is a graph of house temperatures in a 40' x 500' broiler house with six-week-old broilers during hot weather where the attic inlets were not latched closed. When the house was in the lower stages of tunnel ventilation, the attic inlets were open only slightly. When the last fans came on, the static pressure increased to the point where the attic inlets were fully opened. The producer commented that the open attic inlets did not cause any significant problems. She said if they had she would have immediately closed them. The fact that the temperature rise from the pad to fan end of the house during the day was five degrees or less confirms the grower's observation. Had the inlets been contributing significantly to the house heat load, the temperature difference between the two ends of the house would

have been significantly greater than five degrees. Temperature measurements taken in an empty 50' X 500' house with and without attic inlets during hot weather resulted in similar findings. When the attic inlets were opened the temperature difference at bird level between the tunnel inlet and fan end of the house increased less than one degree. Producers on other farms with counter-weighted attic inlets have reported about a one-degree hotter tunnel fan end when attic inlets were left open when tunnel ventilating with older birds.

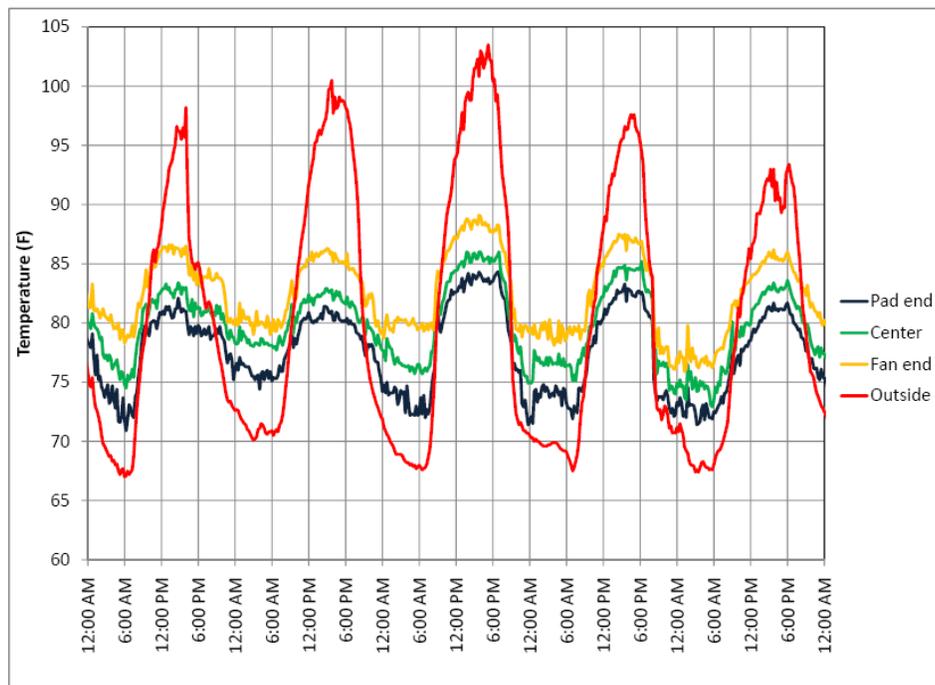


Figure 7. House temperatures in a house with attic inlets left “unlatched” when tunnel ventilating.

It must be emphasized that this doesn't mean that attic inlets shouldn't be closed during hot weather with older birds. But, it is important for producers to keep the magnitude of the “problem” in perspective, especially during the spring and fall. Producers sometimes feel that they have to quickly latch attic inlets closed if a house happens to switch into tunnel ventilation on a warm spring day. The problem is that if it cools off for the remainder of the week then the producer loses the potential benefits of the attic inlets if they don't go back and unlatch the attic inlets. It is just simpler and actually more beneficial to leave the attic inlets unlatched. If a producer feels the attic inlets are warming their house too much, simply decrease the static pressure setting on their side wall inlet machine and the attic inlets will begin to close. When tunneling, the attic opened inlets may lead to another tunnel fan running during the warmest portion of the day but the added ventilation will lead to improved air quality. Once a house is tunnel ventilating the majority of the time, then the attic inlets should be closed.

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