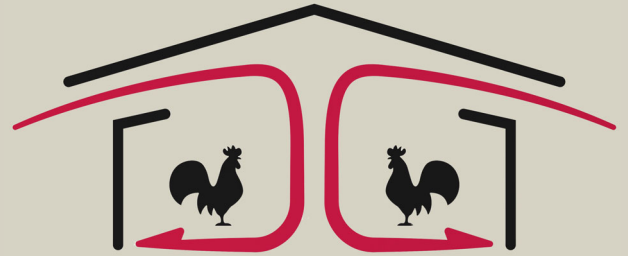




# Poultry Housing Tips

Using Circulation Fans to Improve Foot Pad Health

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Preventing injury to a chicken’s foot pads (paws) is very important for a number of reasons. First, chicken paws are a valuable product, a delicacy in some cultures, and often sell for as much as two to three times as breast meat on a per-pound basis. Secondly, foot pad lesions can become infected, resulting in leg problems and a decrease in overall bird performance. Last but not least, a chicken’s feet are a good indicator of litter quality. Numerous studies have documented the primary cause of pad lesions as excess litter moisture. Minimal pad damage typically indicates that the litter is dry, the house has been properly ventilated, the drinkers have been well managed, and as a result ammonia levels have been low and the birds will likely perform well.

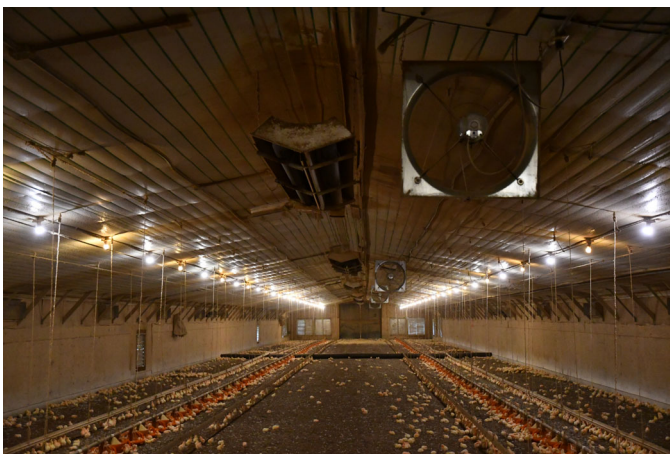


Figure 1. 24" circulation fan system

The primary way to reduce litter moisture and thereby protect foot health is ventilation. As ventilation levels are increased, the relative humidity of the air in a house will decrease, which will tend to pull more moisture from the litter, thereby resulting in lower litter moisture levels. For instance, decreasing the relative humidity from 60% to 40% will increase the rate moisture will move from the litter into the air by approximately 50%, making it much easier to maintain dry litter and healthy paws. The problem is, however, to achieve this reduction, ventilation rates would need to be increased

approximately 75%. Since ventilation typically accounts for 50 to 80% of the cost to heat a house, this means lowering the relative humidity 20% could increase heating costs between 40% and 60%.

Another more cost effective way to remove moisture from the litter is to simply increase the amount of air movement over the litter. Relatively damp air can dry the litter, provided a sufficient amount of it is moved over the litter. After all, we can dry a spill with a damp towel provided we move the towel around enough and not just drop it on the spill. For instance, moving 80°F/60% Rh air over the floor at a speed of 150 ft/min will remove the same amount of moisture from the litter each hour as having relatively still air at a temperature of 80°F with a relative humidity of 40% at floor level (Poultry411 App - Litter Drying Time Calculator). It simply comes down to removing moisture from the litter by either ventilating a lot...or ventilating moderately and increasing the amount of air movement over the litter. The biggest difference will be the cost of removing the moisture.

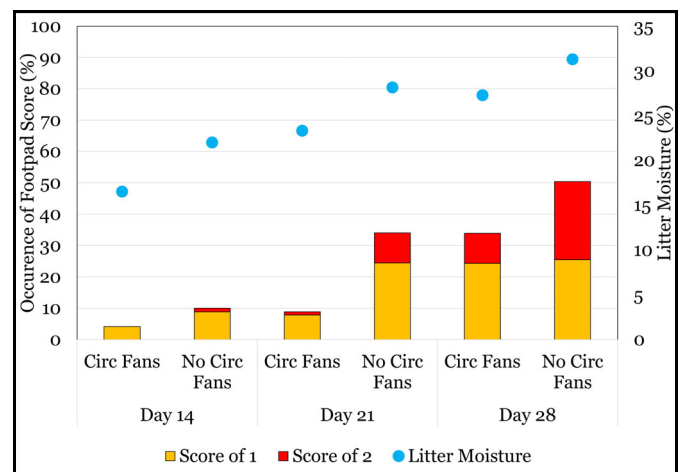


Figure 2. Paw scores and litter moisture from 54' X 600' broiler houses

Over the past five years, nearly a dozen field studies have been conducted by UGA Department of Poultry Science faculty and graduate students exploring the

use of circulation fans to reduce litter moisture and improve foot pad health in broiler houses. These studies revolved around the use of relatively high-volume circulation fans (24", +5,550 cfm) with the objective of circulating at least 20% of a house's volume each minute and in the process generating air speeds of between 100 and 150 ft/min at floor level. The circulation fans on the study farm were operated continuously on all the farms and growers were advised to try to maintain a maximum relative humidity of between 50 and 60% in both the houses with circulation fans and without circulation fans.

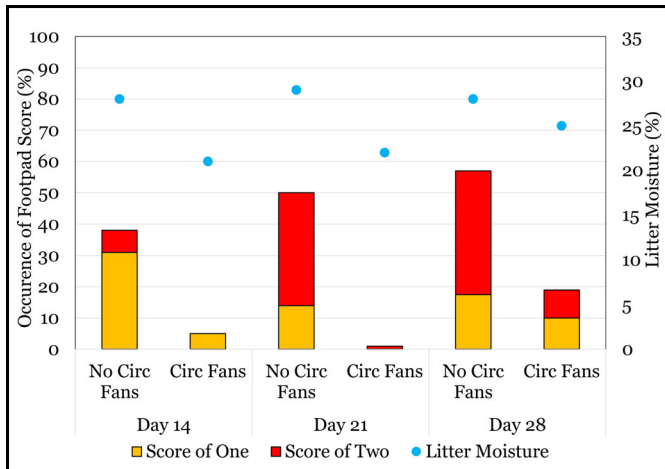


Figure 3. Paw scores and litter moisture from 40' X 500' broiler houses.

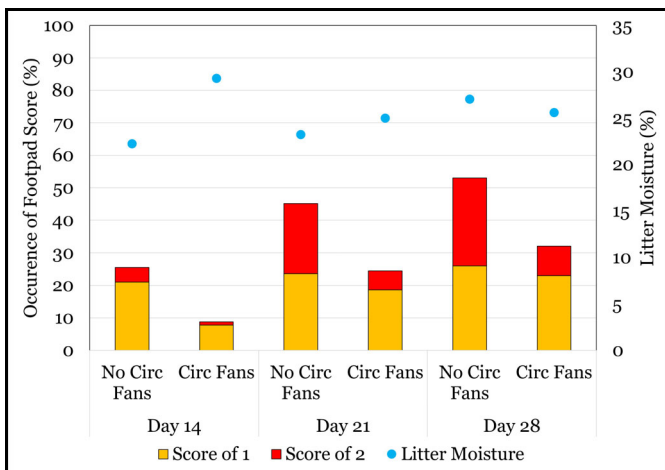


Figure 4. Paw scores and litter moisture from 50' X 500' broiler houses.

On all the study farms, the use of high-volume circulation fan systems significantly reduced both litter moisture and foot pad lesions. Figures 2, 3, 4, and 5 are examples of the differences in litter moisture and paw scores typically seen on the numerous study farms over the years. The magnitude of the difference between the houses with and without circulation fans tended to vary with time of year. As outside temperatures decrease, ventilation rates decrease and humidity levels tend to rise. High

humidity levels tend to reduce the rate at which moisture moves from the litter into the air, hence increasing the need for supplemental air movement to aid in the removal of excess moisture from the litter. During warmer weather, both ventilation rates and amount of air movement over the litter increase, lessening the benefit of providing supplemental air movement over the litter.

It is important to note that though circulation fans did improve litter moisture removal under relatively humid conditions, there are limits. On farms where the Rh exceed 65% for a long period of time, it was very difficult to control litter moisture and therefore foot pad health, even with circulation fans.

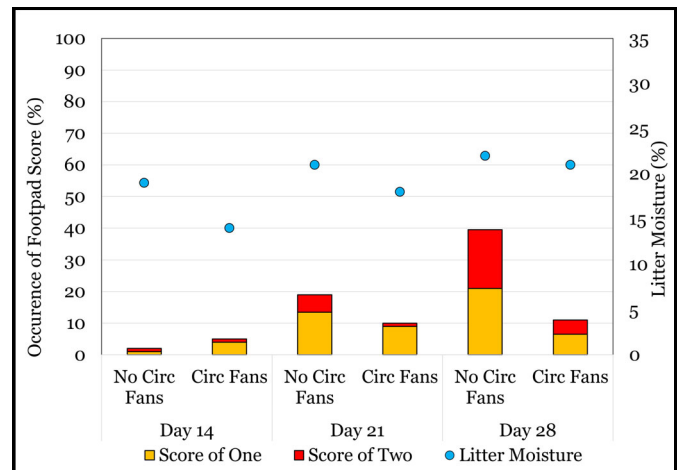


Figure 5. Paw scores and litter moisture from 40' X 500' broiler houses.

The circulation fans tended to have the greatest effect during the first couple of weeks of the flock. This is somewhat to be expected because during this time period the birds cover the least amount of floor space, thereby maximizing the amount of litter the exposed to air movement generated by the circulation fans

Growers didn't report any increase in fuel usage or adverse bird reaction related to the use of the high volume circulation fans. Growers often reported that the air "felt better" in the houses equipped with the circulation fans and house temperatures and heater runtimes tended to be more uniform.

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Mou, C. 2020. Litter management strategies in a commercial broiler house. Doctoral dissertation, University of Georgia, Athens. ScholarWorksUGA.