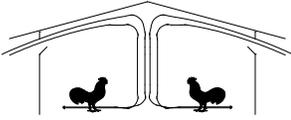




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Poultry Housing Tips

Simple Chart to Help Determine Minimum Ventilation Rates

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One of the keys to controlling poultry house litter moisture is to simply remove the same amount of moisture the birds are adding each day. If you remove less than they are adding, moisture will start to build-up and eventually you will end up with caked litter and ammonia. If you remove more, over time you will tend to over dry the litter resulting in dusty conditions and high heating costs.

To accurately determine how much ventilation it takes to remove a gallon of water you first need to know both inside and outside temperature and relative humidity. A psychrometric chart can then be used to determine the precise amount of moisture there is in the air inside and outside the house (Figure 1). Once these values are known it is just a matter of doing some simple math to calculate how much air you need to exchange to remove each gallon of water the birds are adding to a house. Though highly accurate, this method is simply too time consuming and complicated to be used on most poultry farms.

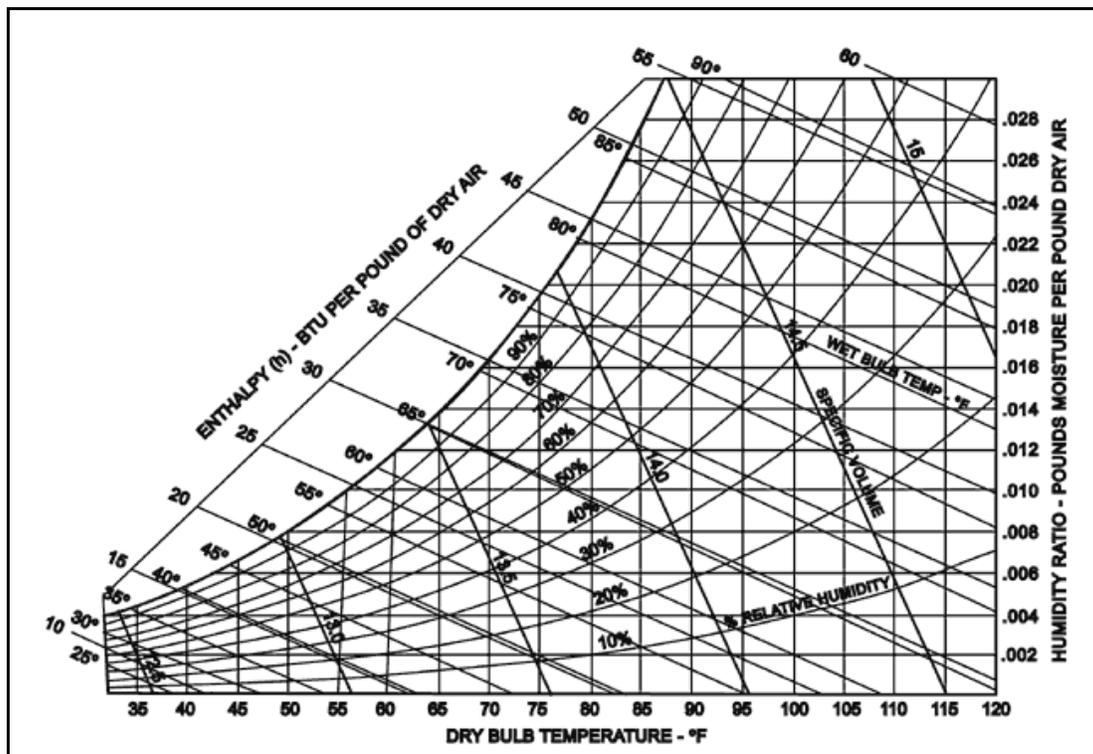


Figure 1. Psychrometric chart allows determination of the amount of moisture in the air.

The calculation process can be dramatically simplified if a few assumptions are made. First, since we are primarily concerned with moisture control during cold weather, it is best to assume fairly typical wintertime conditions; for instance, 30°F and 50% Rh. Second, we may assume an inside relative humidity of 60%, which is generally recommended for optimal bird health. Last, but not least we need to assume that roughly 80% of the water the birds drink is put back into the litter and air in a house. With these three assumptions a simple table can be developed to determine the runtime of two or four 36" fans (9,000 cfm per fan) to remove the moisture the birds add to a house for every 100 gallons consumed (Table 1).

Inside temperature	Two - 36" fans	Four - 36" fans
90°F	<i>5 seconds</i>	<i>3 seconds</i>
80°F	<i>10 seconds</i>	<i>5 seconds</i>
70°F	<i>15 seconds</i>	<i>8 seconds</i>
60°F	<i>20 seconds</i>	<i>10 seconds</i>

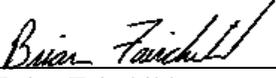
Table 1. Fan runtime (out of 300 seconds) for every 100 gallons of water consumed.

Table 1 makes it very easy to quickly determine ventilation rates to control house moisture. For instance:

- 1) Broiler-breeder house consuming 500 gallons of water (inside temperature = 60°F). Two 36" fans need to operate 20 seconds out of 300 for every 100 gallons of water consumed. Therefore, if the birds are drinking 500 gallons then the fans need to operate 100 seconds out of 300 (20 seconds X 5 hundred gallons).
- 2) Broiler house consuming 1,200 gallons of water (inside temperature = 80°F). Two 36" fans need to operate 10 seconds out of 300 for every 100 gallons of water consumed. Therefore, if the birds are drinking 1,200 gallons then the two fans need to operate 120 seconds out of 300 (10 seconds X 12 hundred gallons).
- 3) Broiler house consuming 500 gallons of water (inside temperature = 90°F). Two 36" fans need to operate 5 seconds out of 300 for every 100 gallons of water consumed. Therefore, if the birds are drinking 500 gallons then the two fans need to operate 25 seconds out of 300 (5 seconds X 5 hundred gallons).
- 4) Pullet house consuming 700 gallons of water (inside temperature = 70°F). Two 36" fans need to operate 15 seconds out of 300 for every 100 gallons of water consumed. Therefore, if the birds are drinking 700 gallons then the two fans need to operate 105 seconds out of 300 (15 seconds X 7 hundred gallons).
- 5) Turkey house consuming 2,000 gallons of water (inside temperature = 70°F). Four 36" fans need to operate 8 seconds out of 300 for every 100 gallons of water consumed. Therefore, if the birds are drinking 2,000 gallons then the four fans need to operate 160 seconds out of 300 (8 seconds X 20 hundred gallons).

It is important to keep in mind that minimum ventilation rates provided by the chart are only an estimate. To insure you are ventilating enough to control house moisture levels it is best to continually monitor house relative humidity. If the relative humidity is above 70%, litter moisture levels are on the rise and ventilation rates should be increased. If the relative humidity is consistently running below 50% you may be removing excessive moisture from the litter and over time the house can become dusty. Furthermore, for younger birds ventilation rates may have to be greater to manage ammonia, carbon dioxide and carbon monoxide levels.


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