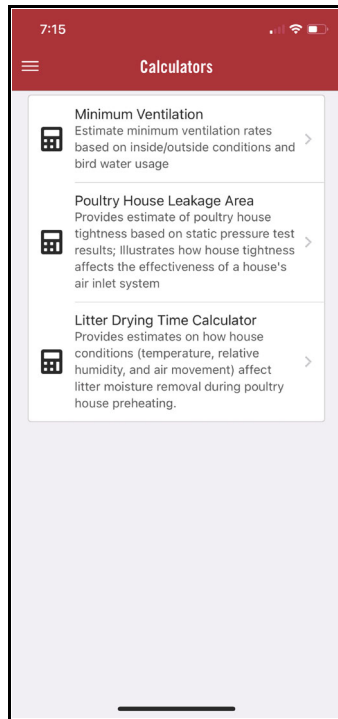
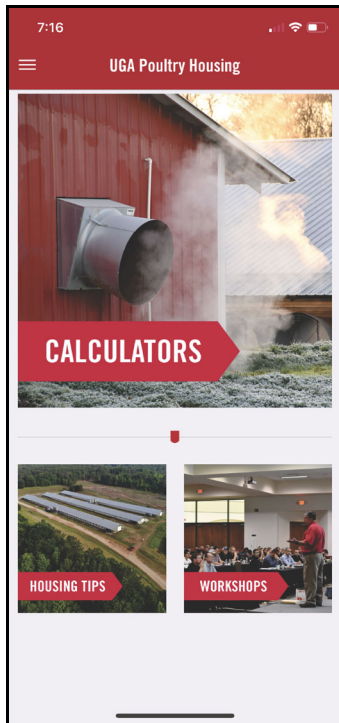
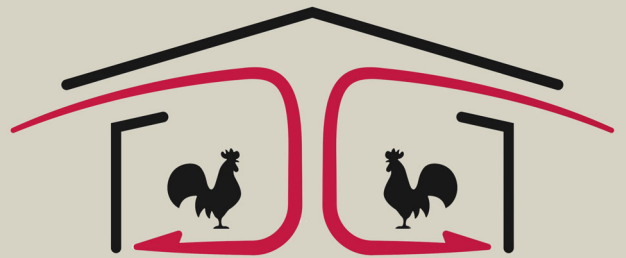




Poultry Housing Tips

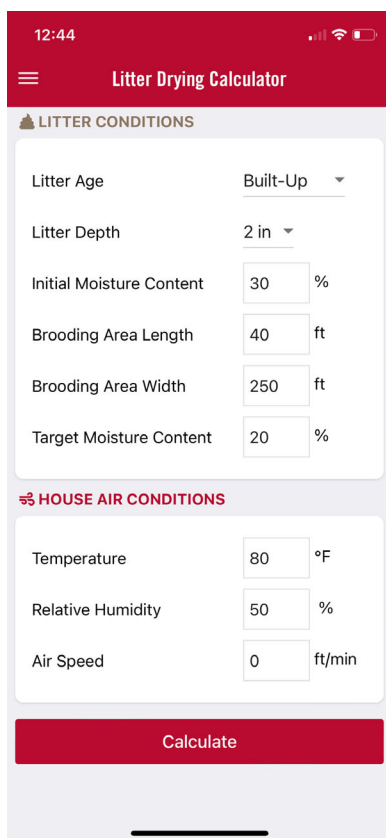
Poultry411 App - Litter Drying Time Calculator

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When placing chicks it is crucial to their future performance and health to make sure the litter they are placed upon has been thoroughly warmed. Though the air in a house can be heated relatively quickly, insuring the litter throughout a brooding area is heated to between 85°F and 95°F can take from 12 and 36 hours depending on the type of heating system, level of air movement, house tightness, litter moisture level, etc. Since the chicks are in constant contact with the litter, insufficient preheating time can result in low litter temperatures which can be as problematic, if not more, than low house air temperatures.

An equally important, yet commonly overlooked aspect of litter preheating, is litter drying. Damp litter will not only result in chilled chicks, but since litter moisture plays a major roll in ammonia generation, higher litter moisture levels tend to result in higher ammonia levels and/or reduced litter treatment life.



Ideally, litter moisture upon placement should be approximately 15%. But how long should a house be preheated to ensure that the litter has been properly dried? As you might suspect, it primarily depends upon the initial level of litter moisture, which is why it is important to ventilate a house as much as possible prior to preheating. Other important factors include house air temperature, relative humidity, litter type, litter depth, and the amount of air movement over the litter during preheating. Since all these factors interact, it can be difficult to come up with a single amount of time houses should be preheated to ensure optimal litter conditions.

Recently, a calculator was added to the Poultry411 app to provide producers with a relatively simple way of exploring how the various environmental factors affect litter moisture removal rates during preheating. The calculator is based on the extensive work conducted by a leading expert in the area of poultry house litter moisture, Dr. Mark Dunlop of the Department of Agriculture and Fisheries, Queensland

Government, Australia. With the calculator, the user inputs litter type (built-up/pine shavings), litter depth (2", 4", 6"), initial litter moisture content, brooding area length, brooding area width, target moisture content, air temperature, relative humidity, and air speed at floor level. From this information the calculator will determine the moisture removal rate from the litter (gals/hr and gals/day).

It is important to note that the litter drying times estimated by the calculator are most accurate for determining moisture removal from the top two inches of the litter. For four- and six-inch litter depths to meet the estimated drying times, the litter would most likely need to be lightly harrowed at some time during the preheating period to reach the desired moisture level.

When down times are short, especially during cold weather, it is not uncommon to find litter moisture levels of between 30 to 35% prior to preheating. The calculator can be used to compare how different preheating methods would affect a grower's ability to dry the litter. For instance, if an air temperature of 80°F were maintained during preheating and the relative humidity was 80% (exhaust fans are not operated during preheating), approximately 14.8 gals of moisture would be removed from the litter each hour. At this rate it would take approximately eight days for the litter moisture to reach 15%.

If by contrast, the house temperature were increased to 90°F, the timer fans were operated sufficiently to maintain a relative humidity of 50%, and the house's circulation fans were operating and capable of an air speed of 200 ft/min over the litter, the rate at which moisture is removed from the litter could be increased nearly six fold and as a result it would only take about a day and a half to decrease litter moisture from 35% to 15%.

Though the app was designed to be used to examine moisture removal rates during preheating, the fact is the app can also be used to better understand litter moisture removal at any time during a flock. Yes, when birds are in the house they are adding moisture to the litter, but how changes in house Rh, air temperature, and air movement affect the rate at which moisture will be pulled from litter will still hold true, with or without birds. Higher moisture removal rates will tend to result in dryer litter. Lower moisture removal rates, wetter litter.

LITTER CONDITIONS	
Litter Age	Built-Up
Litter Depth	2 in
Initial Moisture Content	35 %
Brooding Area Length	40 ft
Brooding Area Width	250 ft
Target Moisture Content	15 %

HOUSE AIR CONDITIONS	
Temperature	80 °F
Relative Humidity	80 %
Air Speed	0 ft/min

MOISTURE LOSS PER HOUR	
14.8	gal/hr

MOISTURE LOSS PER DAY	
356.2	gallons/day

DAYS TO ACHIEVE TARGET MOISTURE CONTENT	
8	day(s)

LITTER CONDITIONS	
Litter Age	Built-Up
Litter Depth	2 in
Initial Moisture Content	35 %
Brooding Area Length	40 ft
Brooding Area Width	250 ft
Target Moisture Content	15 %

HOUSE AIR CONDITIONS	
Temperature	90 °F
Relative Humidity	50 %
Air Speed	200 ft/min

MOISTURE LOSS PER HOUR	
78.3	gal/hr

MOISTURE LOSS PER DAY	
1,879.8	gallons/day

DAYS TO ACHIEVE TARGET MOISTURE CONTENT	
1.6	day(s)

Whether the calculator is used to estimate litter drying times prior to chick placement, or for the situation where there are older birds in a house, it is hoped that it will provide producers with a better understanding of how the management of house air temperature, humidity, and air movement affects ability to keep their litter dry and their birds productive and healthy.

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