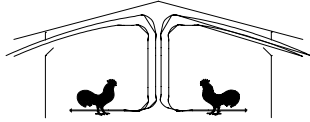




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# *Poultry Housing Tips*

## *Measuring Light Intensity in Poultry Houses*

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Light intensity during a grow-out can have a significant effect on broiler performance. It is generally recommended that a house be kept fairly bright during the first three to five days of brooding so that the young chicks are stimulated to find feed and water quickly. As the birds get older light intensities are typically lowered to reduce bird activity, thus improving feed conversions. The question many producers have is how bright is bright and how dark is dark?



Figure 1. Light meter



Figure 2. Light meter with sensor orientated toward light source.

First, since the human eye has an incredible ability to adjust to different light levels, it is difficult just by standing in a poultry house to accurately determine the light intensity. Further complicating things is that the time of day you enter a house can have an effect on what a person perceives the light intensity to be. For instance, entering a house during the day when it is very bright outside may make the house seem darker than it really is. Conversely, entering a house after the sun goes down may make a house seem brighter than it actually is. The only way to maintain consistent light levels from house to house on a farm, as well as, from one growout to another is through the use of a light meter.

### PUTTING KNOWLEDGE TO WORK

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Light meters typically measure light intensity in terms of *foot-candles*. A foot-candle is the amount of illumination produced by a standard candle at a distance of one foot. To put this in perspective direct sunlight is between 5,000 to 10,000 foot-candles. A brightly lit grocery store is typically between 100 and 200 foot-candles, while light intensity in a room in your house is typically between 10 and 20 foot-candles.

Some light meters can measure light intensity both in term of foot-candles and Lux. A lux is the metric measure of light intensity. One lux is the amount of illumination produced by a standard candle at a distance of one meter. To convert lux to foot-candles, simply multiply the measurement in lux by 10.75.

So what is the optimal light intensity for growing broilers? According to most of the research conducted over the years, it is best to have a minimum of two foot-candles of light during the brooding period. What is interesting is that in the past most producers found they did fine with a lighting system that only produced between 0.75 and 1 foot-candles of light intensity at floor level. But now more and more producers are discovering that their birds perform better light intensity is raised during brooding to the recommended two foot-candles. What has changed? Well in the past in clear curtains houses, producers could expect light intensities of well over 10 foot-candles for 12 or more hours a day due to sunlight entering through side wall curtains. As a result the chicks were highly active a significant portion of the day. But today, with broiler houses that have dark curtains or that have solid side walls, the only light the birds receive is that produce by the houses lighting system. As a result producers and poultry companies are learning that the light bulbs that worked well in their traditional clear curtain houses do not produce sufficient light to stimulate the desired level of activity the first week.

What about older birds? Again there have been changes. Traditionally, most producers found that 0.5 foot-candles produced good growth rates and feed conversions. Today, most producers with modern broiler houses find that at a maximum they want 0.2 foot-candles and many are using light intensities as low as 0.05 foot candles. Why the change? The facts are that with the modern bird we probably do not need the level of light we needed in the past to get the birds to eat. Producers are finding that with lower light intensities the birds are less active which leads to improved feed conversions without sacrificing weights. So what is the optimal light intensity for older birds? No one knows for sure. This is because the optimal light intensity is likely to depend on a number of factors such as bird size, breed, and number of hours of light each day, to name a few, and as a result, there exists a fair amount of debate on the subject.

Since light levels tend to be fairly low in most broiler houses after brooding, it is very important to look for a light meter that can accurately measure light intensities below 0.1 foot candles. To do this a light meter must have a resolution of 0.01 foot-candles and have an accuracy of +/- 3% or better. Though light meters of this quality once cost over \$300, today there are a number available for between \$99 and \$150.

When checking light intensity in a poultry house it is important to measure it at the bird's level. Place the light sensor at floor level making sure you are not casting a shadow on it. To get the most accurate light intensity measurement, angle the meter toward the nearest/brightest light source. For instance, if you are measuring light intensity directly under a light bulb, the meter would point straight toward the ceiling. But if you are measuring light on the side wall, you would need to tilt the meter slightly toward the nearest light bulbs. Since in most cases we are interested in making sure that all the birds receive at least the specified level of light, measurements should be made near the side wall half way between light bulbs where it is typically the darkest.

The importance of proper light meter orientation can be seen in Figure 2. In a house with black curtains, the side wall inlets were opened early in the morning and the light intensity at floor level was first measured with the light meter directed toward the ceiling. Measurements were then taken with the light meter angled toward the inlets on the eastern side of the house. Since most of the light was coming from the eastern inlets, the light meter when angled toward those inlets indicated a light intensity four times higher than what was measured when the light meter was pointed toward the ceiling.

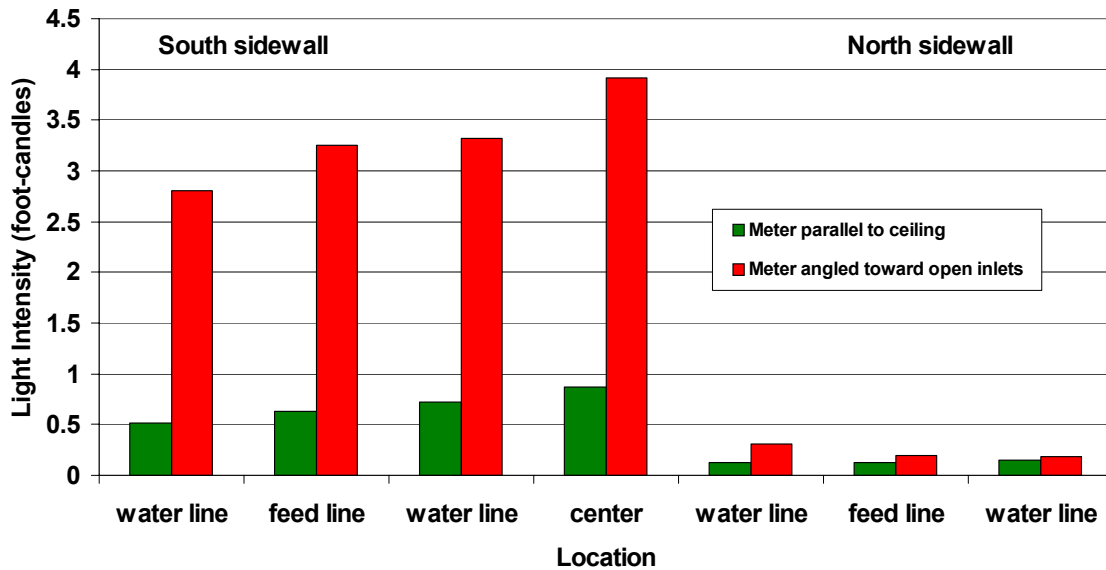


Figure 3. Light intensity at floor level in a broiler house with side wall inlets open.

If a lighting system is properly installed, you should find less than a 20% variation in light intensity. It is best when looking to maintain a specific light intensity that the lowest light intensity found in the house be used as the measure. For instance, if you want a light intensity of 0.1 foot-candles, light dimmers should be adjusted to obtain that light intensity at the darkest part of the house (typically near the side wall, half way between the light bulbs). Once the desired light intensity is obtained the dimmer can be marked so that the same light intensity can be maintained for future growouts. Even though a farm may have four houses wired and built the same, light intensity can and does vary, even when the dimmer switches are set identically. In general, it is best to check light intensities a couple a times a year. The primary reason for this is that light bulbs get dirty overtime which can lower the amount of light they produce by 20% or more.

  
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Provided to you by:

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A few sources for light meters:  
 Davis Instruments 800 368-2516 ([www.davis.com](http://www.davis.com))  
 Farmtek 800 327-6835 ([www.farmtek.com](http://www.farmtek.com))  
 Grainger ([www.grainger.com](http://www.grainger.com))