

VISIONWARE

POULTRY LIGHTING SOLUTIONS

How to Measure Lux in a Poultry House Correctly

A practical guide for even, efficient lighting



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Field guide for poultry
farmers & integrators

INTRODUCTION

Why measuring light levels matters

Light intensity plays a critical role in modern poultry production. It influences bird behaviour, feed intake, growth, welfare and overall flock performance.

However, simply installing a lighting system does not guarantee that the birds are receiving the correct amount of light. The only way to verify the actual light level is to measure it correctly using a lux meter.

Unfortunately, many measurements are taken incorrectly, leading to misleading results and unnecessary adjustments to the lighting system. This guide explains how to accurately measure lux in a poultry house and highlights the most common mistakes to avoid.

1 What is lux?

Lux (lx) is the amount of light that reaches a surface. Unlike lumens, which describe the total light output of a lamp, lux tells you how much usable light is actually available where the birds are located.

KEY POINT

For poultry producers, the important measurement is the light reaching the **birds**, not the light emitted by the fixture.



How light reaches a chicken: lux is the light that falls on a surface, measured at bird level. (Illustration from the VISIONWARE article.)

IN THIS GUIDE

1. What is lux?
2. Use a suitable lux meter
3. Where to measure
4. Measure across the whole house
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6. Check lighting uniformity
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2 Use a suitable lux meter

For reliable measurements, use a good-quality, calibrated lux meter suitable for measuring LED lighting. The meter should have a spectral response that closely follows the **CIE photopic response** and a **cosine-corrected sensor**.

Low-quality meters may respond differently to different light spectra, resulting in inconsistent readings between warm-white, natural-white, cool-white or coloured lighting systems.

When selecting a lux meter

- ✓ Use a calibrated instrument from a reputable manufacturer.
- ✓ Look for a cosine-corrected diffuser.
- ✓ Avoid smartphone applications for lighting verification.
- ✓ Follow the manufacturer's calibration recommendations.

TIP: NO PHONE APPS

Smartphone lux apps are not suitable for verifying a lighting system. Use a proper calibrated meter, and always use the same type of meter when comparing measurements.

3 Where should lux be measured?

Lux should be measured **where the birds experience the light**. Measurements should include positions underneath the light fittings, between fittings, near the walls and in the corners of the house. Avoid relying only on readings taken directly beneath a lamp, as these normally represent the brightest areas.

Sensor placement

The sensor should typically be placed:

- ✓ At bird head height.
- ✓ On the surface or slightly above it.
- ✓ Pointing straight upward toward the ceiling.
- ✓ Away from shadows created by your body.

NEVER DO THIS

Never hold the meter close to the light fitting or against the ceiling. That measures the **fixture**, not the lighting conditions experienced by the birds.

4 Measure across the entire poultry house

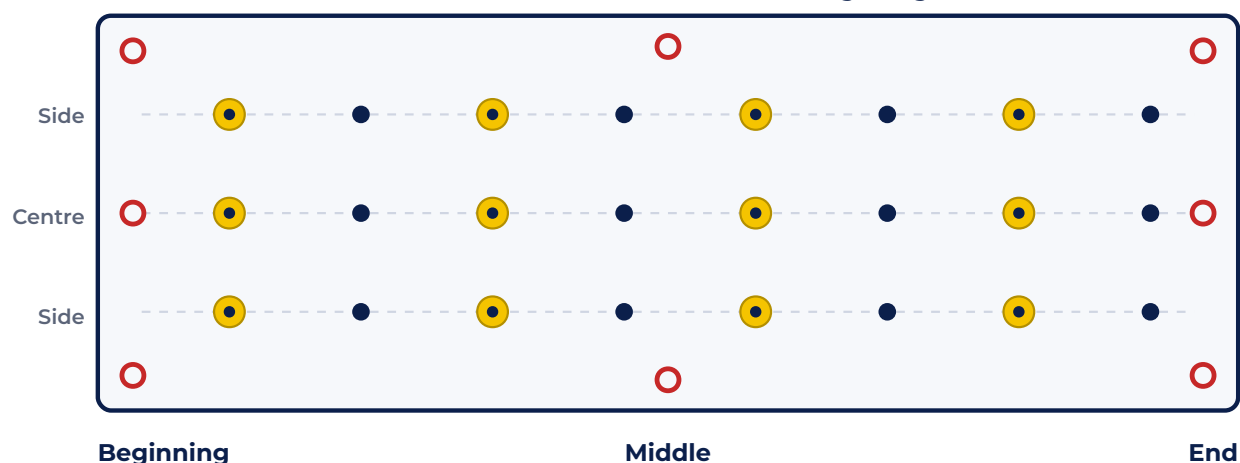
Taking multiple measurements provides a true picture of lighting uniformity. Cover the whole building:

- ✓ Measure along both side rows.
- ✓ Measure down the centre rows.
- ✓ Include areas between fixtures.
- ✓ Include corners.
- ✓ Include the beginning, middle and end of the house.

TIP: SPACING

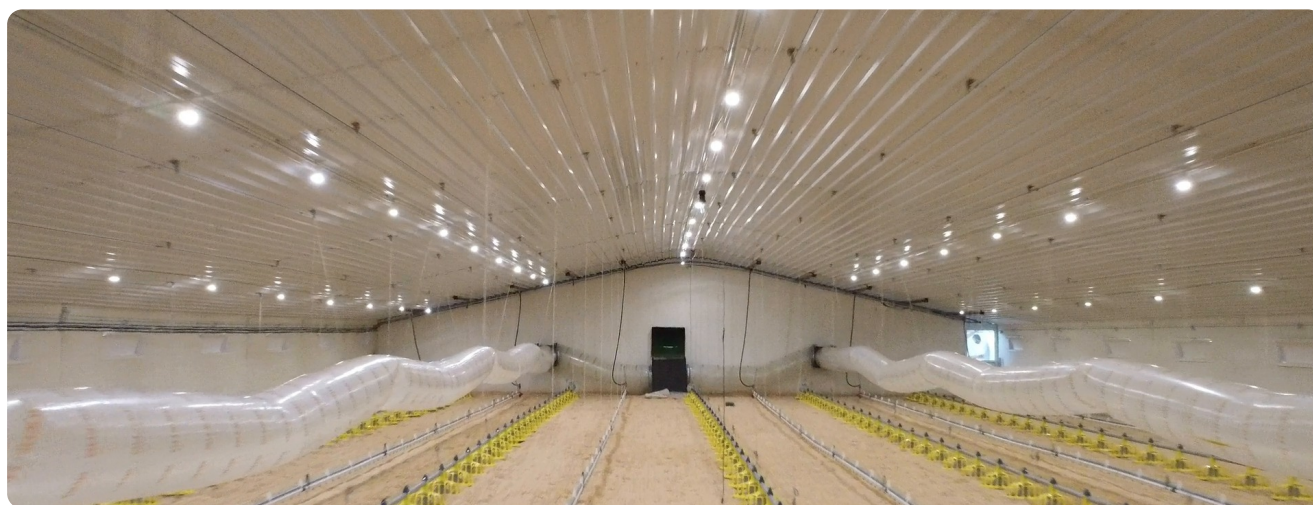
For large poultry houses, measurements every **3–5 metres** along each row generally provide good coverage. More measurement points produce a more accurate assessment.

Plan view of house – measure on a regular grid



- Light fitting (reading underneath)
 ● Reading between fittings
 ○ Near walls & corners

Schematic only: sample under fittings, between fittings, near the walls and in the corners, along side and centre rows from the beginning to the end of the house.



An evenly lit house interior (VISIONWARE drone footage). Readings should cover the full length and width of the house, not just the brightest spots.

5 Record the average lux

Lighting systems are designed around the **average illuminance**, not the highest reading. Looking only at the brightest or darkest point can give a misleading impression of the overall lighting performance.

Worked example

Measurement point	Reading (lux)
Point 1	23
Point 2	20
Point 3	21
Point 4 (minimum)	19
Point 5	22
Average	21

AVERAGE LUX

Sum of readings ÷ number of readings

$$(23 + 20 + 21 + 19 + 22) \div 5 = \mathbf{21 \text{ lux}}$$

REMEMBER

Record every reading, then calculate the average. Don't judge the system on a single bright or dark point.

6 Check lighting uniformity

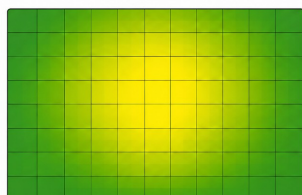
Uniform lighting is just as important as the average lux level. Large differences in light intensity encourage birds to gather in brighter areas while avoiding darker sections of the house. Good lighting systems aim to minimise these variations so that birds experience consistent conditions throughout the building.

UNIFORMITY

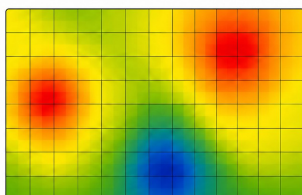
Uniformity = Minimum lux ÷ Average lux × 100

Using the example above: $19 \text{ lux} \div 21 \text{ lux} \times 100 = \mathbf{90.5\% \text{ uniformity}}$

GOOD UNIFORMITY ✓



POOR UNIFORMITY ✗



Low lux  High lux

Aim for consistent light levels throughout the house.

Good uniformity reduces stress, improves growth and ensures better bird welfare and performance.

IF READINGS VARY A LOT

If some readings are significantly higher or lower than others, adjustments may be required to:

- ✓ fixture spacing,
- ✓ mounting height, or
- ✓ dimming levels.

Good vs poor uniformity (illustration from the VISIONWARE article).

7 Common mistakes to avoid

Many inaccurate lighting assessments result from simple measurement errors. Avoid these common mistakes:

✗ Measuring directly underneath a light fitting only

✗ Taking only one reading

✗ Holding the sensor at chest height

✗ Blocking the sensor with your body

✗ Tilting the sensor instead of keeping it level

✗ Using a smartphone lux application

✗ Using an uncalibrated or low-quality meter

✗ Measuring immediately after switching the lights on, before they have stabilised

✗ Ignoring areas between fixtures and near the walls

✗ Comparing measurements taken with different meter types

WHY IT MATTERS

Incorrect measurements lead to misleading results and unnecessary adjustments to the lighting system. A single reading beneath a lamp normally shows the brightest area, not what the flock experiences.



LED fittings along the house (VISIONWARE drone footage). Measure at bird level, never close to the fitting.

8 Best-practice measurement procedure

For reliable and repeatable results:

- 1 **Allow the lighting system to stabilise** before taking measurements.
- 2 **Place the lux meter at bird height.**
- 3 **Keep the sensor horizontal** and facing upward.
- 4 **Measure throughout the poultry house** using a regular grid.
- 5 **Record every reading.**
- 6 **Calculate the average lux** level.
- 7 **Check for areas** with unusually high or low readings.
- 8 **Repeat measurements** after any lighting adjustments.

Final thoughts

Accurate lux measurements are essential for verifying that a poultry lighting system performs as intended. Using the correct instrument, measuring at the correct height and collecting readings across the entire house will provide a far more reliable assessment than a single measurement beneath a lamp.

CONSISTENCY PAYS OFF

Consistent measurement methods also make it easier to compare houses, evaluate lighting upgrades and maintain the desired lighting conditions throughout each production cycle.

TAKE IT INTO THE HOUSE

Lux measurement checklist

Before you start

- ☐ Calibrated lux meter from a reputable manufacturer, suitable for LED lighting
- ☐ Meter has a cosine-corrected sensor/diffuser (CIE photopic response)
- ☐ Calibration is in line with the manufacturer's recommendations
- ☐ No smartphone app; same meter type as previous measurements
- ☐ Lighting system switched on and allowed to stabilise

While measuring

- ☐ Sensor at bird head height, on the surface or slightly above it
- ☐ Sensor horizontal and pointing straight up toward the ceiling
- ☐ Body clear of the sensor: no shadows
- ☐ Readings along both side rows and down the centre rows
- ☐ Readings under fittings *and* between fittings
- ☐ Readings near the walls and in the corners
- ☐ Beginning, middle and end of the house covered (regular grid, e.g. every 3–5 m in large houses)
- ☐ Every reading recorded

After measuring

- ☐ Average lux calculated (sum of readings ÷ number of readings)
- ☐ Uniformity calculated (minimum lux ÷ average lux × 100)
- ☐ Unusually high or low areas identified
- ☐ Spacing, mounting height or dimming adjusted if needed
- ☐ Measurements repeated after any lighting adjustment

TEMPLATE

Lux reading record sheet

Farm / house: _____

Date: _____

Meter (make/model): _____

#	Row (side / centre)	Position (under / between / wall / corner)	Distance along house (m)	Lux
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				
22				
23				
24				

Minimum lux	Average lux	Uniformity = min ÷ avg × 100

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POULTRY LIGHTING SOLUTIONS

Need help with even lighting in your house? **Contact VISIONWARE.**

VISIONWARE designs and manufactures lighting, electrical and agricultural solutions in Kempton Park, South Africa, including poultry LED lighting.

5W Poultry LED with +Blue

- Calming blue mode for placement and catching
- Excellent uniformity with no dark spots
- Fully dimmable

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