LIGHTING RECOMMENDATIONS

BASELINE LIGHTING RECOMMENDATIONS

- Use intermittent lighting when chicks arrive, can use for the first 7–14 days
- Lights should be high intensity, 3–5 footcandles (30–50 lux) minimum at the waterline
- Use 18–20 hours of full lighting after intermittent lighting
- Start dimming lights at 4 weeks of age down to 0.5–1.0 footcandles (5–10 lux)

Variety	Age to Step Down	Hours of Constant Light	Body Weight for Stimulation (lbs)
W-36	12 weeks	12 hours	2.7/2.8/2.9
W-80	8 weeks	11 hours	2.7/2.8/2.9
LSL-L	8 weeks	10 hours	2.7/2.8/2.9
Hy-Line Brown	8 weeks	10 hours	3.0/3.25
Lohmann Brown	8 weeks	10 hours	3.0/3.25

LIGHT STIMULATION

Brown Birds

- 3.0 lbs – increase to 12 hours of light (or 13 hours if already on 12 hours)
- 3.25 lbs – add one hour
- Add 1 hour per week until 14 hours
- Add one hour then 30 minutes per week until max light reached (15–16 hours)
- For cage-free, adding light in the morning until 30% production, then do two 30-minute stimulations in the evening and then add remaining time to morning. Save the last stimulation for increasing in the morning.

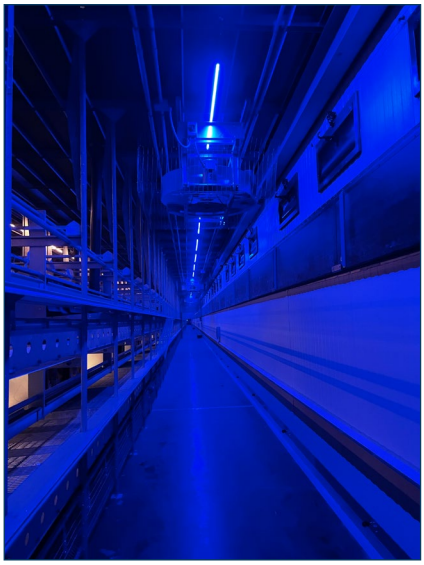
STANDARD LIGHTING PROGRAM FOR BROWN BIRDS			
Age	10 Hr Constant Light	11 Hr Constant Light	Notes
1	Intermittent Lighting	Intermittent Lighting	4 hours on, 2 hours off
2	20 hours	20 hours	
3	18.5 hours	18.5 hours	
4	16 hours	16 hours	
5	14.5 hours	14.5 hours	
6	13 hours	13 hours	
7	11.5 hours	12 hours	
8 wk until 3.0 lbs	10 hours	11 hours	
At 3.0 lbs	12 hours	12 hours	Add in morning
At 3.25 lbs	13 hours	13 hours	Add in morning
+1 week	14 hours	14 hours	Add at night
+2 weeks	14.5 hours	14.5 hours	Add at night
+3 weeks	15 hours	15 hours	Add in morning
+4 weeks	15.5 hours	15.5 hours	Add in morning, can wait to add this stimulation until 30 wk or if nest crowding is observed.
+5 weeks	16 hours	16 hours	Add in morning

Leghorns

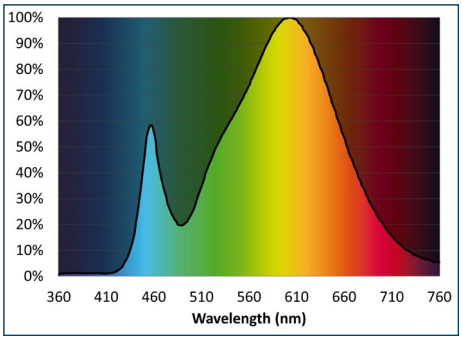
- 2.7 lbs – more eggs, smaller eggs
- 2.8 lbs – balanced
- 2.9 lbs – fewer eggs, larger eggs
- If at 10 or 11 hours, jump to 12 hours at body weight, if at 12 hours, go to 13 hours
- Add 30 minutes per week until max light reached (15–16 hours)
- For cage-free, adding light in the morning until 30% production, then do two 30-minute stimulations in the evening and then add remaining time to morning. Save the last stimulation for increasing in the morning.

STANDARD LIGHTING PROGRAM FOR LEGHORNS					
Age	**10 Hr Constant Light**	**11 Hr Constant Light**	**12 Hr Constant Light (W-36 only)**	**Notes 1**	**Notes 2**
1	Intermittent Lighting	Intermittent Lighting	Intermittent Lighting	4 hours on, 2 hours off	
2	20 hours	20 hours	20 hours		
3	18.5 hours	18.5 hours	18.5 hours		
4	16 hours	16 hours	16 hours		
5	14.5 hours	14.5 hours	15 hours		
6	13 hours	13 hours	14 hours		
7	11.5 hours	12 hours	13 hours		
8 wk until 2.7/2.8/2.9 lbs	10 hours	11 hours	12 hours		
At 2.7/2.8/2.9 lbs	12 hours	12 hours	13 hours	Add at night	Add in morning
+1 week	12.5 hours	12.5 hours	13.5 hours	Add at night	Add in morning
+2 weeks	13 hours	13 hours	14 hours	Add at night	Add in morning
+3 weeks	13.5 hours	13.5 hours	14.5 hours	Add at night	Add in morning
+4 weeks	14 hours	14 hours	14.5 hours	Add in morning. Hold at 14 hours for an extra week if concerned about double yolk/egg size.	Add at night. Hold at 14 hours for an extra week if concerned about double yolk/egg size.
+5 weeks	14.5 hours	14.5 hours	15 hours	Add at morning	Add at night
+6 weeks	15 hours	15 hours	15.5 hours	Add at night	Add in morning
+7 weeks	15.5 hours	15.5 hours	16 hours	Add at night	Add in morning
+8 weeks	16 hours	16 hours	16 hours	Add at night	Add in morning

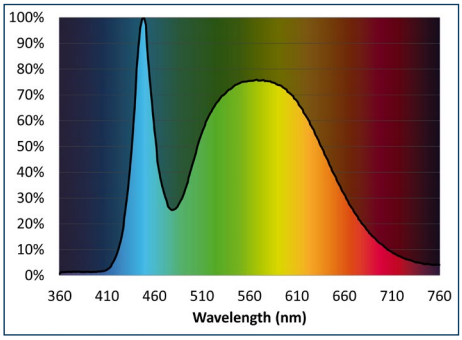
LIGHTING SPECTRUMS



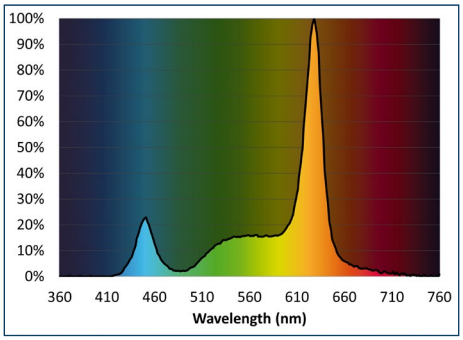
- Ideally use cooler light (5000K) for pullets and warmer lights (2700–3000K) for the layers.
- In reality, most in-system tube lights are warm lights and the aisle lights may be warm or cool.
- For layers, in-system lights can be basic warm lights; aisle lights should be a 3- or 4-channel light that allows for changing colors to assist bird behavior.
- Under-system lights should always be rope or tube lights and should be 5000K.
- There is a lot of research to be done on light spectrum changes, especially during the day. Modern lights have thousands of combinations of light spectrums that have yet to be fully explored. We are working on developing some standard recipes to use for multi-channel lights.
- Pure blue lights can be used to calm birds for vaccinations or moves.



LED 2700K



LED 5000K



LED Red

OTHER CAGE-FREE LIGHTING SUGGESTIONS

- Sunrise/sunset
  - » Sunrise should be no more than 5 minutes.
  - » Sunset should start by shutting off the under-system lights, then dimming the aisle lights over 10–15 minutes.
  - » Then dim the higher tier of the system over 10–15 minutes.
  - » Then dim the lower tier of the system over 10–15 minutes.
- Low uniformity
  - » Keep lights consistent for at least two weeks without additional stimulation.
- Light intensities should be all adjusted together
  - » Aisle, system, and under-system lighting should all be increased or decreased together.
- Document baseline light settings
  - » Document any changes for future flocks or to go back if something does not work.

MEASURING LIGHT WITH A SPECTROMETER

Aviaries

- Aisle – at bird head height
- Under system – measure at bird height at entrance to under system
- Lowest level perch – on aisle, pointed at aisle lights
- Feed trough – measure over top of perch/feed guard
- Water line – measure next to nipple
- In front of nest – measure facing towards aisle
- Second level perch – on aisle, pointed at aisle lights

Barn (level and between light fixtures for all readings)

- Outside wall – pointed towards light
- Feed line – pointed towards light
- Water line – closest to nest boxes, pointed towards light
- Nest boxes – right outside nest boxes pointed towards light

Cage

- Every cage from floor to top row and between light fixtures (10–40 readings)
- Put spectrometer near the feeder and aim towards the closest light

- Always aim the spectrometer directly at the light source for the most accurate measurements
- Save files and locations for later comparison
- When trying out new spectrum combinations, save file along with specific light recipe for replication
- Use these settings:
  - » Foot candles (fc) or lux – measures light intensity
  - » Peak wavelength (λp) – measures dominant spectrum
  - » Chromaticity (CCP or Tcp) – measures average of all light colors

LIGHT INTENSITY GOALS

Location	Pullet (after 3 weeks)	Layer
Aisle (chicken height)	0.5–1.5 fc	0.5–2.0 fc
Feed trough	1.0–3.0 fc	2.0–4.0 fc
Water line	3.0–5.0 fc	3.0–5.0 fc
Under system (if available)	5.0–10.0 fc	5.0–10.0 fc
Barn litter	0.5–1.5 fc	3.0–5.0 fc
Barn water/feed	0.5–1.5 fc	2.0–3.0 fc
Nest	n/a	1.0–3.0 fc
Cage	0.5–1.5 fc	1.0–3.0 fc combined avg.

LIGHT INTENSITY NOTES

- First three weeks of chick placement should be 3–5 fc (closer to 5 ideally) at the water line.
- Dimmer settings for under system should always be within 15–20% of the aisle dimming systems. The under system will read higher because the spectrometer is closer to the light source.
- Bring pullets into the lay house at the higher end of intensity and start dimming at peak lay.
- By 40 weeks of age, the house should be at the lower end of light intensity.
- Every system will vary, these are very general guidelines. Always measure 2–3 sections to account for different intensity bulbs, twisted rope/tube lights, cleanliness, and other factors.