

# Lighting for Layers

Aviagen Turkeys Ltd ®



## Definition

- A lighting programme is a combination of important factors that describe the light intensity, duration and light source(s) applied.
- To initiate reproduction, turkey breeders must be photo stimulated by increasing the day length. This requires the breeder females to be held for a period on short day lengths prior to photo stimulation and then the day length increased to start egg production. This process mimics what happens to wild turkeys that start to breed in spring (increasing day length) after the end of winter (short day length).

## Objectives

- To provide a lighting programme that ensures poults get off to the best possible start and achieve their desired growth profile.
- To ensure that the birds productive development is both normal, synchronized within the flock and timed to coincide with transfer to the laying farm.
- Design a lighting programme to maximize egg production. This programme needs to take into account day-length, light intensity and light source.

## General

Always check light intensities with a calibrated light meter, clean light bulbs or tubes regularly to remove the dust that accumulates on them reducing their effectiveness, replace burnt out or damaged bulbs / tubes immediately and ensure time clocks are properly adjusted. Light intensity should be measured at bird eye height at several places in the house both under and between the light sources so that a good average is obtained.

The information presented here is based on practical experience and may need to be adapted according to house type and specific operational conditions. Advice for other housing systems can be obtained from Aviagen Turkeys Management Specialists.

## Procedures for Lighting in Rear

At placement it is important to have sufficient light for the poults to be able to find both feed and water and establish good patterns of feeding and sleeping. For the first two days aim for a maximum of 100 Lux (range 30 to 100 Lux).

### Brooding to 12 weeks

- The position of the light source relative to the brooder is important to ensure that the brooder surround is evenly illuminated.
- Light intensity should be gradually reduced from day two to achieve 10-30 Lux at 7 days. If birds have not been beak treated, 10 Lux is recommended.
  - If reduction in light intensity is too slow or the lights are too bright it may encourage injurious pecking or litter eating.
  - If reduction in light intensity is too fast or the lights are too dim then a reduction in feed intake and general activity may occur.
  - In either case remedial action must be taken immediately.



High light intensity may lead to injurious pecking. Keep a constant watch for signs of head, wing or vent pecking which may lead to high poult mortality. If such behaviour is seen, reduce light intensity immediately to 10 Lux or less but only for a temporary period

- An intermittent light programme may encourage feeding and general poult activity. This can be started after placement, but only after the poults have settled down and found both feed and water. Usually this can be started after a minimum of two hours but can be delayed for a further two hours if the poults are particularly active.
  - An example of an intermittent light programme is alternate cycles of two hours light followed by two hours of dark. This programme is normally used for a minimum of 2 days after placement but can be continued for up to 4 days if necessary.
  - *Warning: Always check local regulations and codes of practice concerning the minimum and maximum periods of continuous illumination for poultry*
- A few days after the poults have been released from the brooder surrounds and have access to the whole house, light intensity should be gradually raised to 30 Lux over the next few days.
- If the poults are released from the surrounds onto litter based on chopped straw the lights may have to remain dimmed at around 10 Lux for a few extra days to help prevent litter eating.
- From brooding until the end of week 11 the light intensity should be kept constant at around 30 Lux, with a day length of 14 hours (see Table 1).

**Table 1: Lighting programme in rear**

Age (weeks)	Hours (Light: Dark)	Level Intensity (Lux)
2 - 11	14L 10D	30 Lux
12	13L 11D	Slowly increase from 30 Lux to 50/60 Lux over this period
13	12L 12D	
14	11L 13D	
15	10L 14D	
16	9L 15D	
17	8L 16D	
18-28/29	6/7L 17/18D	50-60 Lux

**Warning:** Always check local regulations and codes of practice concerning the minimum and maximum periods of continuous illumination for poultry.

#### From 12-29 Weeks

During the conditioning period the day length is decreased to 6/7 hours and the light intensity increased to between 50 and 60 Lux (see Table 1 above). From 18 weeks of age breeder females must be reared under a short day length to ensure that they can be stimulated into egg production by an increase in day length when transferred to the laying houses.



If a light intensity of less than 50 Lux is used during the conditioning phase then it is possible that the females will come into lay slowly and not achieve a good peak egg production

It is important to ensure that during dark periods no light enters the house. To achieve this fans and air inlets must be adequately light-proofed without reducing the efficiency of the ventilation system. There must also be no light leakage from doors, hatches or other openings.

It is a good idea to have a system to indicate when the house lights are off, e.g. a red indicator lamp outside the house. This will reduce the risk of personnel entering the house during the dark period and accidentally exposing the birds to light. Also it is good practice to display notices with the times of lights on and off at the house entrance.

It is also good practice to ensure that all stock inspections and other tasks that need to be completed e.g. vaccinations or equipment maintenance are planned so they can be accomplished within the light period. Avoid the temptation to leave the lights on for an extra hour to get the job finished.

Dusk to dawn lighting systems can be used to provide a more natural change from day to night and vice versa.



If light is allowed to enter the house, even for a brief period or the flock is exposed to a longer day length during the conditioning period the females can be photo stimulated and squat or lay prematurely. This adversely affects egg numbers and size (more small eggs) and may decrease peak production and fertility

If at any time during the conditioning phase birds are seen to be squatting, this is an indication that there is a problem that need rectifying either by improving the light proofing, checking the lighting system (particularly time clocks) or that management procedures are not negating the short day length.

### Procedures for Lighting in Lay

Transfer to laying houses usually takes place when the females are 29 to 30 weeks of age and photo stimulation takes place on the day of transfer by moving from the short day length to one of 13 to 14 hours. The hens must always move to a higher light intensity from that used during rearing and a light intensity of 100 Lux or more during lay is recommended. Egg production will normally start 14 to 18 days after photo stimulation.

Lighting breeder females before 29 weeks can reduce egg production and increase the number of small reject eggs produced. Lighting breeder females after 30 weeks can result in a higher egg peak followed by lower persistency of lay. This can reduce the overall number of eggs produced and increase cost per egg.

Natural daylight provides the best light intensity and quality having a broad spectrum of wavelengths. The red part of the spectrum of long wavelength (600 to 700nm) has been shown to be most important for the photo stimulation of egg production. When using fluorescent lighting, care must be taken to select tubes that emit light in the red wavelength.



Day length or light intensity during lay must NEVER be allowed to decrease. Reducing the day length can induce the hens into a premature moult (feather loss) and egg production can be lost.

### Lay In Controlled Environment Housing

When artificial lighting is used it should include a high proportion of the long red wavelength (e.g. Standard tungsten filament / Warm white fluorescent). A recommended programme is shown in table 2 below.

**Table 2: Lighting Programme in lay**

Age (weeks)	Production Week	Total Hours	Week of Age	Production Week	Total Hours
29½	Stimulation	14	43	12	15½
30	Stimulation	14	44	13	15½
31	0	14	45	14	16
32	1	14	46	15	16
33	2	14	47	16	16
34	3	14½	48	17	16
35	4	15	49	18	16
36	5	15	50	19	16
37	6	15	51	20	16½
38	7	15	52	21	16½
39	8	15½	53	22	16½
40	9	15½	54	23	16½
41	10	15½	55	24	16½
42	11	15½	56	25	16½

### Lay In Naturally Ventilated Housing

- When hens are brought into production in naturally ventilated (open or curtain sided) housing during periods of long natural day length, then this day length **MUST** be maintained throughout the laying period.
- When the days are short, not more than 14 hours of light, e.g. in winter, then follow the same lighting programme as detailed above for hens in controlled environment houses.
- Flocks which come into production before the longest day will always be on a naturally increasing light programme, having increments of approximately ½ hour per week up to a maximum of 17 hours day length.
- Aim to start the daylight period to coincide with the natural daylight, as using artificial lights early in the morning will unnecessarily extend the day.
- On dull days when there is little or no sunlight the natural daylight must be supplemented by using artificial lighting. If in doubt, check light intensity with a light meter. It is also possible to install a photoelectric cell which is calibrated to switch on the lights when the natural light intensity falls below 100 Lux.

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