# Effect of light on broiler performance

Light enters to the eye of the bird and sends a message to the brain through optical nerve which stimulates pituitary gland to release hormone. It stimulates broiler chicks to eat more to gain muscle.

Lighting programs are a key factor for good broiler performance and flock welfare. Lighting programs are typically designed with changes occurring at predetermined ages and tend to vary according to the final target market weight of the broilers. Lighting programs designed to prevent excessive growth between 7 and 21 days have been shown to reduce mortality due to ascites, sudden death, leg problems. Research indicates that lighting programs which include 6 hours of continuous darkness will improve the development of the immune system.

One standard lighting program will not be successful for all parts of the world. Therefore, the lighting program recommendations listed in this guide should be customized based on the environmental conditions, house type and overall objectives of the growers.

The intensity and distribution of light alters broiler activity. Correct stimulation of activity during the first 5-7 days of age is necessary for optimal feed consumption, digestive and immune system development. Uniform distribution of light throughout the house is essential to the success of any lighting program.

It is recommended that 25 lux (2.5 foot-candles), in the darkest part of the house, as measured at chick height, be used during brooding to encourage early weight gains. Optimum light intensity at floor level should not vary by more than 20%. After 7 days of age, or preferably at 160 grams body

weight, light intensities should be diminished gradually to 5-10 lux (0.5-1 fc).

Traditionally, broilers are grown on a continuous light in management scheme which allowed maximum feeding time, and as a consequence, maximum growth rate. Many scientists recommended 1 or 2 hour dark in a 24 hours cycle to accustom the chicks to darkness in case of power failure. Somebody opinioned that intermittent lighting improves the FCR and performance of bird. However, research studies (Aviagen group with a University) examined the relationship between length of light and broiler performance in commercial broiler farm has shown that mentioned day length is not always correct. During research light wavelength, light intensity, photoperiod length and light distribution were considered. In broiler house 17 to 20 hours of light per day with all darkness provided in one period will show best result.

**The updated information on the response of broilers to light is given below.**

The key points are:

• The response to light does not differ between strains or sexes.

• Broiler performance is not optimized by providing 23 hours of light and this lighting program is not recommended.

• Providing broilers with 23 hours of light has a negative effect on
**-**growth rate
**-**feed intake
**-**mortality
**-**processing performance
**-**broiler welfare

• Broiler performance and welfare are optimized when between 17 and 20 hours of light are given.

## Key Points to Consider When Using a Lighting Program

- Test any lighting program before making it firm policy.
- Provide 24 hours light on the first day of placement to ensure adequate feed and water intake.
- Turn the lights off on the second night to establish when that off time will be. Once set, this time must never change for the life of the birds.
- Use a single block of darkness in each 24-hour period.
- Start increasing the dark period when the birds reach 100-160 grams.

- Allow the birds to feed ad libitum to ensure they go into the dark period full of feed and water and can eat and drink immediately when the lights turn back on. This helps prevent dehydration and reduces stress.

- The birds should be weighed at least weekly and on days that the program is scheduled to be adjusted. The lighting program should be adjusted according to the average weight of the birds. Past experience of a particular farm's performance should also be considered.
- The length of the dark period should be increased in steps and not in gradual hourly increases. (see programs)
- Reducing the dark period before catching reduces "flightiness."

- Reduce the darkness in times of warm weather if the birds are being stressed during the day and feed intake has been reduced.
- In wintertime coincide the off time with dusk so the birds are awake during the coldest part of the night.
- In the summer time coincide the on time with sunrise.
- Do not turn the feed off during the dark period.
- Broiler producers need to design their lighting programs to coincide with natural daylight.
- 48 hours prior to catch, increase light intensity to 10/20 lux to acclimate the birds to catching - only if daylight catching is practiced!

### Three Lighting Programs

1. Standard Lighting Program - Option 1 (Slaughter weight: <2.5 kg)

2. Standard Lighting Program - Option 2 (Slaughter weight: 2.5 - 3.0 kg)

3. Standard Lighting Program - Option 3 (Slaughter weight: >3.0 kg)

1. Standard Lighting Program - Option 1

- Slaughter weight: <2.5 kg (5.5 lbs)

| Age days | Hours dark | Hours change |
|---|---|---|
| 0 | 0 | 0 |
| 1 | 1 | 1 |
| 100-160 grams | 6 | 5 |
| Five days before kill | 5 | 1 |
| Four days before kill | 4 | 1 |
| Three days before kill | 3 | 1 |
| Two days before kill | 2 | 1 |
| One day before kill | 1 | 1 |

2. Standard Lighting Program - Option 2

- Slaughter weight: 2.5 - 3.0 kg (5.5 - 6.6 lbs)

| Age days | Hours dark | Hours change |
|---|---|---|
| 0 | 0 | 0 |
| 1 | 1 | 1 |
| 100-160 grams | 9 | 8 |
| 22 | 8 | 1 |
| 23 | 7 | 1 |
| 24 | 6 | 1 |
| Five days before kill | 5 | 1 |
| Four days before kill | 4 | 1 |
| Three days before kill | 3 | 1 |
| Two days before kill | 2 | 1 |
| One day before kill | 1 | 1 |

3. Standard Lighting Program - Option 3

• Slaughter weight: >3.0 kg (6.6 lbs)

| Age days | Hours dark | Hours change |
|---|---|---|
| 0 | 0 | 0 |
| 1 | 1 | 1 |
| 100-160 grams | 12 | 11 |
| 22 | 11 | 1 |
| 23 | 10 | 1 |
| 24 | 9 | 1 |
| 29 | 8 | 1 |
| 30 | 7 | 1 |
| 31 | 6 | 1 |
| Five days before kill | 5 | 1 |
| Four days before kill | 4 | 1 |
| Three days before kill | 3 | 1 |
| Two days before kill | 2 | 1 |
| One day before kill | 1 | 1 |

## Lighting Program Benefits

- A period of darkness is a natural requirement for all animals.
- Energy is conserved during resting, leading to an improvement in feed conversion.
- Mortality is reduced, and skeletal defects are reduced.
- It stimulates broiler chicks to eat more to gain muscle.
- It prevents excessive growth between 7 and 21 days (?) have been shown to reduce mortality due to ascites, sudden death, leg problems
- The light/dark period increases melatonin production, which is important in immune system development.
- Bird uniformity is improved.
- Growth rate can be equal to or better than that of birds reared on continuous light.
- It accustoms the chicks to darkness in case of power failure.