

Preparing breeder pullets correctly for light stimulation

Preparing pullets correctly for light stimulation is fundamental to achieving the best results from a broiler breeder flock. This process starts when pullet chicks are placed in the rearing house and continues right up to light stimulation in the production cycle at 21 to 22 weeks.

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Management guidelines often do not include bird conditioning as a factor for light stimulation. For example, light stimulation is usually based on age and availability of housing regardless of weight, body condition and fat reserve. It is crucial that pullets are reared in optimum conditions so they can achieve all the criteria required before light stimulation occurs. The key points to consider are:

- Basic husbandry practices.
- Light control during rearing.
- Uniformity.
- Pullet growth stages and weight management.
 - Phase 1: 0-8 weeks.
 - Phase 2: 8-12 weeks.
 - Phase 3: 12-16 weeks.
 - Phase 4: 16-20 weeks.
- Light stimulation.

Basic husbandry practices

Birds have basic minimum requirements that must be met 24 hours a day and should remain constant throughout the bird's life. As flock managers, we control all aspects of the bird's life. We decide when the bird eats and drinks, and warmth of the environment. It is crucial that

our husbandry practices are accurate and consistent.

Guides and standards have been developed to achieve optimum results. These recommendations can be found in our management and product guides. Among the basic requirements, feed can be the most variable. Water, ventilation and lighting should be constant and monitored through an integrated controller. The flock manager is responsible for allocating proper amounts of feed that must be weighed and evenly distributed, and for deciding how much feed to provide each week to ensure the pullets are achieving the desired body weight standard. Feed distribution must be monitored every day.

Remember that automated feeders are not automatic; it takes daily 'Hands On' management to ensure feed systems are working properly.

Light control during rearing

During rearing, lighting programs for pullets usually start after 14-21 days and must be carefully managed to encourage growth and normal activity and to control the birds' sexual maturation (photo stimulation).

To achieve this, we recommend that pullets be reared at low light intensity (5-7 lux) with shortened day-length (eight hours of daylight per day) to suppress photo stimulation.

Generally, the eight-hour day length can start when the birds consume their everyday restricted amount of feed in four hours or less. Rearing houses should have 100% light control with no light leaks.

There should be absolute discernment between day and night. Leakage of light in rearing can start



Poor pullet uniformity at five weeks. There is still time to improve this, but we should not allow this to happen.

to confuse the bird's 'internal clock', leading to an uneven response to light stimulation in the production house. This uneven response can be responsible for delayed production, poor peaks and poor persistency.

Flock uniformity

Uniformity is essential to ensure birds respond evenly at the point of light stimulation. Uniformity starts at the hatchery; chicks should be separated by size at the hatchery and placed by size at the farm.

Young flock source chicks or smaller chicks should be given an opportunity to achieve body weight standard by four weeks. These chicks have the same production potential as the larger chicks, but can be put at an early disadvantage if not managed properly.

Many factors can lower uniformity, particularly feed. Inadequate feeder space and poor feed distribution are two main causes of poor uniformity. Every bird should have an equal opportunity to eat at feeding time. Alternative feed programs

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Table 1. 28 day protein consumption (field data).

	Top Co.	Top 25%	Bottom 25%
Protein (g at 4 weeks)	171.8	153.5	134.6
HE/HH	165.9	161.6	131.5
Mortality (%)	12.5	11.2	20.4

Table 2. Fleshing confirmation of females.

Week	Breast score (%)			Pelvic fat (%)
	2	3	4	
12	60	40	–	–
16	40	60	0	No fat
19	<10	60	30	>65
20	<5	60	35	>85
21	–	60	40	>90

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might be beneficial to improve feed availability, including 4/3, 5/2 or skip-a-day programs.

Good uniformity in the rearing cycle is generally when $\pm 10\%$ of a flock is 70-80% of the average for a desired weight standard. If a flock falls below 70%, this could start to negatively affect the production cycle; flocks above 80% are generally better performers.

Pullet growth phases

Weight management is important during each phase.

● Phase 1. Up to eight weeks.

The first four weeks of a bird's life can affect their performance for their whole life in the flock. The first seven days of brooding for pullets is not a feed restrictive period. Chicks should be on ad libitum feed. Brooding for the first seven days for cockerels and pullets should not be much different than for broilers. A goal for pullets should be to gain four times their placement weight at seven days.

An internal Cobb trial was done to measure early protein intake during the first four weeks in pullets.

Flocks that consumed more than 170g of protein had better egg production and mortality. Flocks that consumed around 130g of protein had three times less bone density (see Table 1).

Early protein intake (160-180g at four weeks) is important for proper development of trabecular bone (calcium store). It is vital to achieve the four-week weight target.

By eight weeks, 78% of the frame development is complete. Good frame uniformity is essential for Phase 1.

● Phase 2. Begins after eight weeks and continues through to 12 weeks.

This is a period of controlled growth and further frame development. At 12 weeks 90% of the frame is developed. The opportunity for further frame development is all but over. During Phase 2, a majority of the birds should have a fleshing of

'2' (see Table 2). This period is for building the skeleton – not breast development.

It is common to see pullets overweight during Phase 2. Pullets that become overweight and over fleshed during this phase generally do not perform as well in the production cycle. They do not deposit fat as well while carrying the extra muscle and weight. Bodyweight is controlled by feed intake. A feeding pattern must be developed to achieve the desired bodyweight curve.

Fig. 1 shows a feeding pattern to achieve a desired female bodyweight curve. Fig. 2 shows a feeding pattern with pullets overweight during frame development.

Remember, we are dealing with a broiler breeder.

We are building a breeder to make broilers, but essentially we are turning a bird with broiler genetics into a breeder. Knowing this, we must understand that our breeder wants to grow like a broiler, and we must control the weight through the life cycle.

● Phase 3. From 12 to 16 weeks.

This starts the process of building condition in the pullet. 12 weeks is the start of puberty. Muscle development should start to take place with increased breast fleshing.

By 14 weeks, 95% of the frame is built. At 16 weeks around 60% of

the birds should have a breast fleshing of '3' with some birds still with a fleshing of '2'.

Feed increases will start to become larger from 14-16 weeks, with the largest increases at 16-17 weeks. This is the beginning of Phase 4, or the 'Turn Up' phase from 16-20 weeks.

● Phase 4.

The bird's bodyweight should increase 33 to 36% to build body conformation and fat reserve before light stimulation. This is measured by evaluating breast fleshing and pelvic fat. It is important that 'Turn Up' takes place while the bird is still under low light intensity (5-7 lux), and regulated day length (eight hours).

If birds are photo-stimulated before building conformation and fat reserve, they will not perform as well during the production cycle. The bird's body will not be physically ready to handle the reproductive system starting up.

Light stimulation will trigger the reproduction process whether the bird is ready or not. If the bird is not ready, you could see a delay in production, prolapse, lower peak production, poor persistency and increased bodyweight. 'Turn Up' is accomplished by aggressive feeding from 15-18 weeks. Feeding patterns are important to accomplish this.

Again, see Fig. 1 for feeding patterns.

The larger feed increases (approximately 6-9g depending on the flock and feed) are designed to push the female past the point of building muscle and to begin storing energy as fat.

The larger increases should taper off by 18-19 weeks. If larger increases are given after 20 weeks, birds will realise this weight gain after light stimulation at 21-22 weeks.

It is important to evaluate birds from 16-20 weeks to monitor the fleshing and fat development along with monitoring bodyweight. Again, see Table 2 for reference of fleshing and fat. Birds must have a combination of fat and fleshing before light stimulation in relation to bodyweight.

Some flocks may achieve the target bodyweight, but do not deposit fat. It takes a combination of body composition and daily feed to achieve desired egg production.

Each egg has roughly 31-33% lipid content. If birds do not have a fat reserve at the onset of lay, the female will pull energy from other areas of the body to help make an egg. Lack of fat storage can cause her to be less efficient and not perform as well.

Monitoring pelvic fat is a recommended option for measuring fat deposits before light stimulation. Pelvic fat is checked by feeling either side of the pelvic bone for fat and muscle fill. You should feel the pelvic bones rounding-off and the outside bone depression being filled in with fat tissue.

Starting from 16-20 weeks, birds should have a pelvic fat and fleshing score relative to their age (see Table 2 for reference).

By 20 weeks 95% of the females should have a fleshing score in the '3-4', with 90% of the birds with pelvic fat reserve. When pullets achieve standard weight, proper fleshing and pelvic fat requirements, light stimulation can take place.

Generally birds are stimulated at

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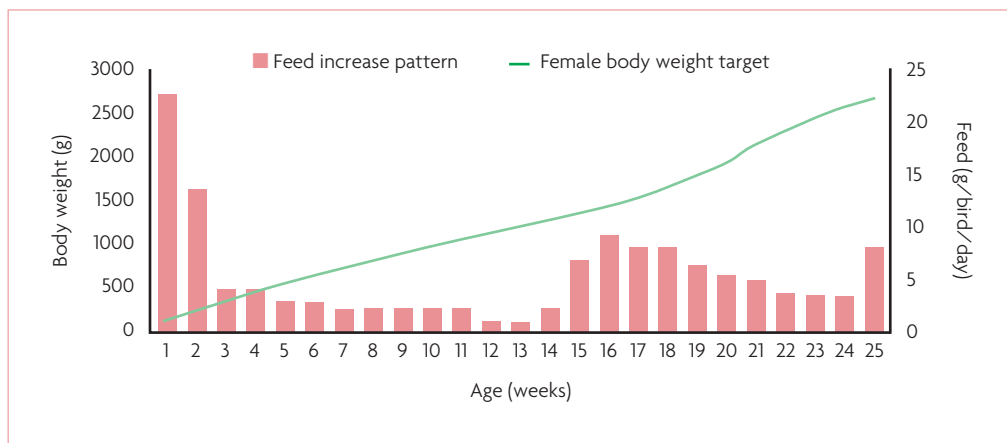
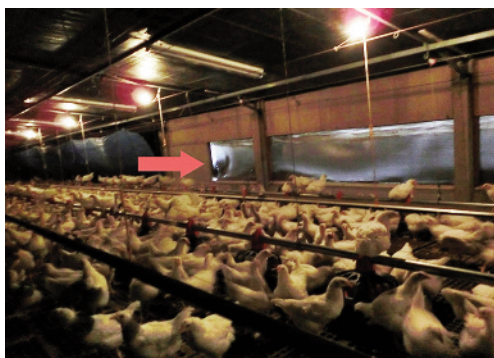


Fig. 1. Feeding pattern to manage growth phases.

Left, light leaking curtains and, right, light leaking fans.



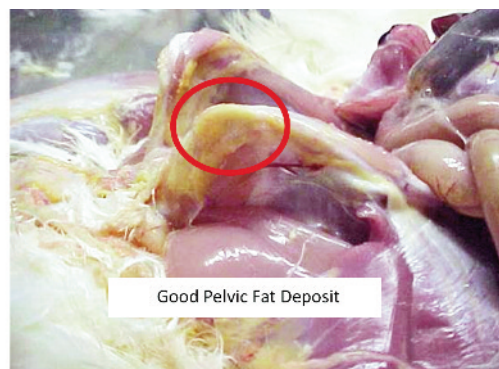
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 21-22 weeks, but if the criteria are not met, light stimulation should be delayed. For example: If pullets have 80% of the birds with proper fleshing and pelvic fat, light stimulation should possibly be delayed for one week.

If pullets only have 70% of the birds with proper fleshing and pelvic fat, light may need to be delayed up to two weeks.

Generally, underweight birds do not have proper fleshing or fat deposits. These smaller birds may require segregation from the main population for delayed light stimulation. Pullets should always be re-evaluated before making the final decision on light stimulation.

Light stimulation

The light intensity is increased to 50-100 lux with 11-12 hours of day length to activate the bird's repro-



By 20 weeks 95% of the females should have a fleshing score in the '3-4' range, with 90% of the birds with pelvic fat reserve.

duction system. When possible, 15 hours of peak light is sufficient. Artificial light stimulation in a chicken house resembles what happens in a natural environment. In spring and summer there is increasing day length with more available food. We want the bird to

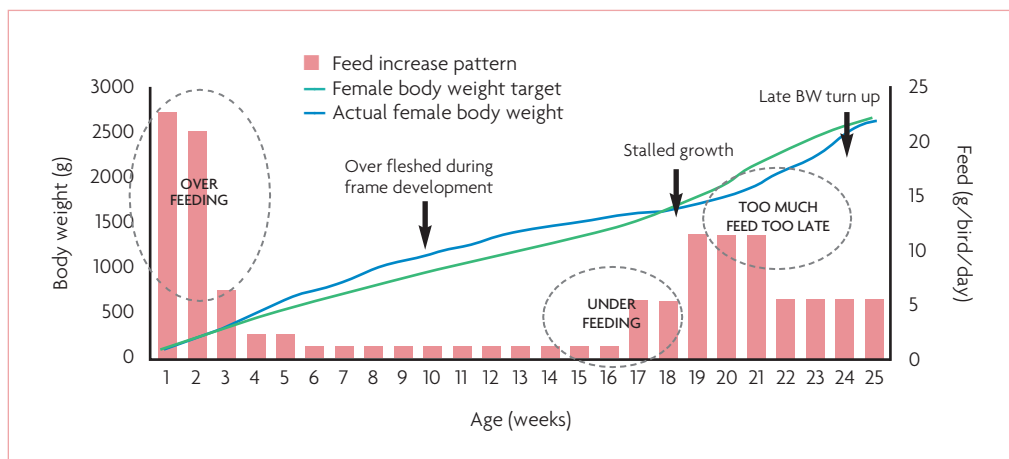
experience the arrival of spring and summer, but in a controlled house environment.

Bird conditioning is especially important for pullets that are moved to a production house with sidewall curtains that allow sunlight to enter. These birds may start with

more than 11 to 12 hours day length depending on time of year. It is also important to cover sunrise and sunset by 30 minutes with artificial light in production houses without light control. A bird should never experience decreasing day length. This is Mother Nature's way of telling the bird that winter is coming.

Decreasing day length triggers the reproduction system to slow down and allow the bird to prepare for winter.

Fig. 2. Feeding pattern to manage growth phases.



Conclusion

In conclusion, broiler breeders have the potential to perform at a high production rate if certain criteria are met. Be willing to make the investment in the pullet on the rearing farm.

Good flock management is essential. Remember, we control every aspect of the bird's life and if we do not maintain good practice throughout, we only have ourselves to blame for substandard performance. ■