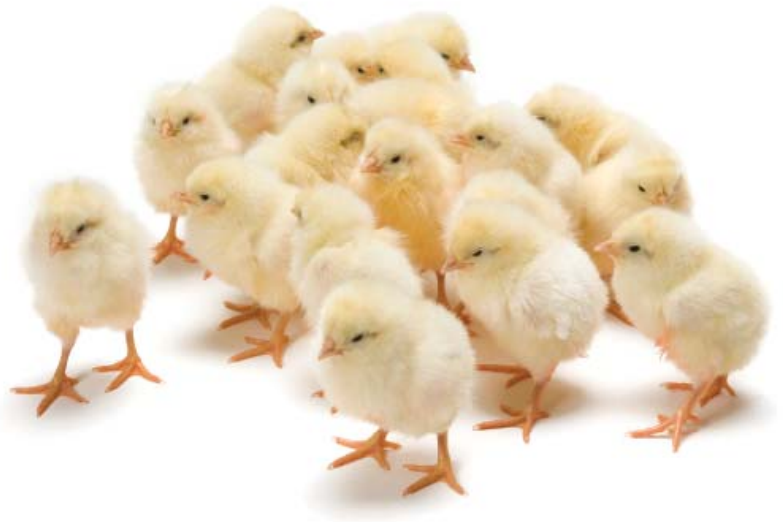
GROWING MANAGEMENT OF W-36 COMMERCIAL PULLETS

Productive and profitable Hy-Line W-36 layers begin with good quality pullets. Having the correct body weight and body type at the start of egg production will enable pullets to achieve their genetic potential. Problems that develop during the growing period cannot be corrected after egg production begins. This paper highlights the components of a good pullet development program.

SHED PREPARATION

The brooder shed should be cleaned and disinfected well in advance of chick delivery. A minimum of 3 weeks down-time or resting period between flocks should be scheduled for shed preparation. Before cleaning and disinfection, all manure and feed should be removed and a rodent control program implemented (or preferably the ongoing program should be continued). This is the time to make necessary repairs to the shed and equipment.

The shed should be cleaned with a high-pressure wet wash with detergent to remove all organic matter. Washing should move from the ceiling downwards through the cages to the floor and finally, manure pit. After thorough cleaning, the shed needs to be sprayed with a suitable pesticide for control of mites, termites and spiders. Later, all contents and the shed should be sprayed or foamed with an approved disinfectant. Increasing the temperature inside the shed will improve the effectiveness of the disinfectant. Additionally, fumigating the shed within 5 days before chick delivery will help ensure sanitary conditions. The effectiveness of the cleaning, disinfection and fumigation should be checked by environmental testing of the shed surfaces for coliform and *Salmonella* bacteria. Drinking water systems should be checked and maintained at this time. Water tanks and water pipe lines should be cleaned, ideally using a disinfectant to remove the biofilms and scales. Later flush with fresh water to remove the residual disinfectant.



Day	Management Schedule
-21 days	• Remove old feed and manure • Rodent control program • Make repairs to equipment (broken drinkers, etc.) • Wet wash and disinfect grower shed
-5 days	• Fumigate brooding shed • Verify cleanliness by bacterial culture of environment
-2 days	• Start brooders in cool and cold climates • Clean and disinfect water pipes and tanks • Place paper inside cages
-1 day	• Start brooders in hot climates • Ensure brooding shed temperatures of 32–33°C for the Hy-Line W-36 • Minimum humidity of 40% • Set lights for 22–23 hours of light @ 30–60 lux at chick level • Fill feeders with fresh starter feed to their highest level that allows the chicks to easily access the feed • Adjust feed guards • Adjust drinkers to proper level • Flush water lines and check that all drinkers are working
+1 day	• Fill cup drinkers or let nipple drinkers drip to stimulate water consumption • Add vitamins and electrolytes to drinking water • Place starter feed inside cage on cage paper

BEFORE CHICKS ARRIVE

The shed preparation should be completed 48 hours before delivery of the chicks. Allow enough time for the temperature of the air and equipment in the shed to be brought to the proper brooding temperature. Be aware that air temperature rises faster than the temperature of concrete floors, feeders, cages and water in the shed. Set the light clocks to 22–23 hours of light at 30-60 lux of intensity at the level of the chicks. Lights in the red-orange wavelength (warm fluorescent) are appropriate for growing and laying birds.

Feeders should be filled to the highest level with fresh, good quality starter feed, preferably in the form of a crumble. Adjust the feed guards. Ensure that all drinkers/nipples are working properly. Adjust the drinkers to the proper height to facilitate drinking by the newly arrived chicks. The birds' drinking water should contain vitamins and electrolytes to reduce stress and replace losses during delivery. Feed should be placed on the cage paper before chick arrival or immediately after they are placed in the cages.

CHICK QUALITY – IN THE BEGINNING

Layer pullet chicks must be sourced from breeder flocks that are healthy and free of vertically-transmitted diseases important for bird and human health. Chicks should possess adequate levels of maternally derived antibodies for early protection against challenges of Gumboro or IBD, Ranikhet disease, Infectious Bronchitis and other diseases. The chick should be of adequate body weight with a well-healed navel (umbilicus) and free of physical defects. All chicks should be vaccinated against Marek's disease with HVT and SB-1 strains from a reliable vaccine manufacturer. The transportation time of the chick delivery from hatchery to farm should be kept to a minimum. Preferably the trucks used for transportation of day old chicks should be closed and environment-controlled to give the chicks optimum comfort during transport.

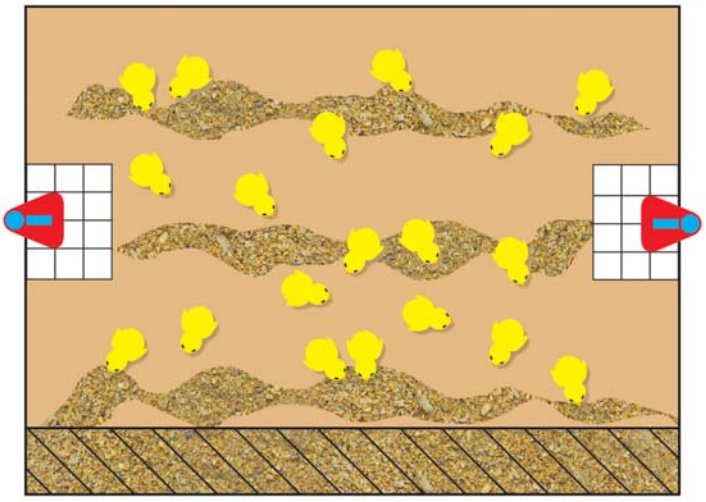
Days of Age	Hy-Line W-36 Cage
1–3	32–33°C (40–60% relative humidity)
4–7	30–32°C
8–14	28–30°C
15–21	26–28°C
22–28	23–26°C
29–35	21–23°C
36+	21°C

BROODING PERIOD – GETTING OFF TO A GOOD START

Pullet chicks arriving to the farm from the hatchery should be alert and active. Chicks must be vigorous enough to explore their new environment and quickly find feed and water. Eating feed and drinking water quickly will speed the development of healthy intestinal microflora and build resistance to enteric pathogens such as *Salmonella* and *E. coli*. During the first week of life, chicks must be provided with constant attention by the manager to ensure optimized temperature, humidity, lights, feed and water availability. The first 2 weeks of life are when the most significant problems for proper chick development can occur. The newly hatched chick is unable to regulate body temperature and must be provided the proper environmental conditions. Relative humidity during the first week should be above 40% to prevent dehydration, drying of mucus membranes and vent pasting. When heaters are used to maintain brooding temperature the relative humidity tends to be lower.

Brooding chicks in cages requires strict management of temperature and humidity as the chicks cannot migrate to an area of comfort like chicks grown on the floor. Chicks started in cages should be placed on paper for 5 to 10 days.

Feed Distribution on Days 1 and 2

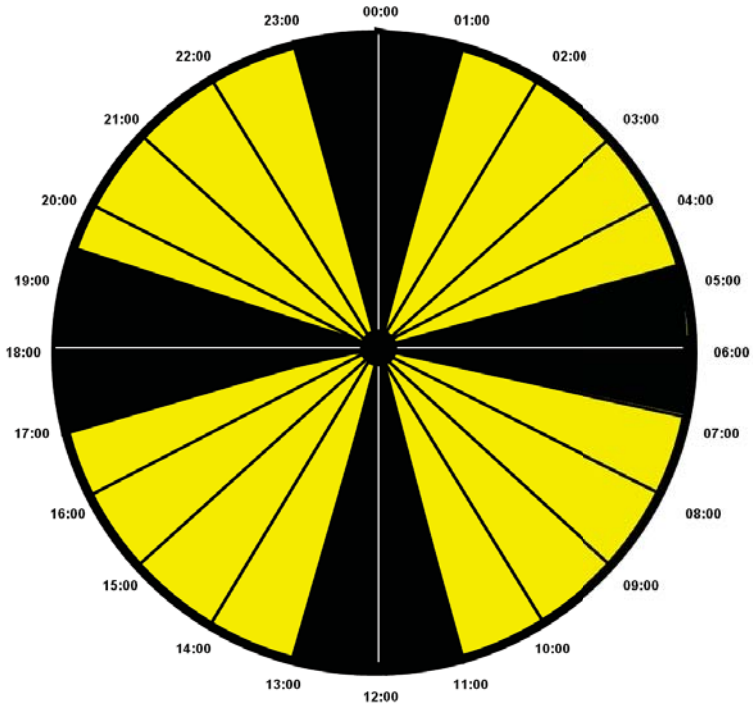


Space Recommendations for Hy-Line W-36 Growing and Laying Birds (Open Housing)

	Growing Period	Laying Period
Cage floor space	54 square inches/bird	67–86 square inches/bird
Feeder	3 inches/bird	4 inches/bird
Cups or nipples drinking system	1 per 12 birds	1 per 8 birds

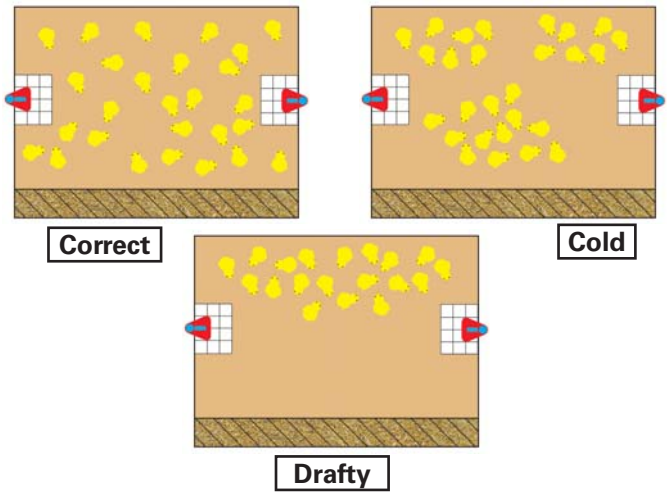
Intermittent Lighting Program for Closed Houses

During the first week, chicks benefit from bright light conditions in the shed. Light intensity should be 30-60 lux with clocks set to 22 to 23 hours. Alternatively, if the shed is equipped with a light timer clock, an intermittent lighting program can be used (4 hours of light followed by 2 hours of darkness, repeated for the first 7 days).



Cage Brooding Temperature

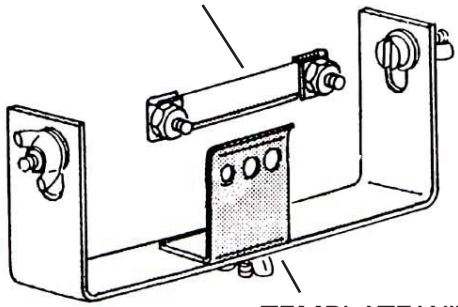
In order to encourage water consumption, keep cup drinkers full of water for the first 3 days or adjust water pressure to cause a hanging drop of water in nipple drinkers. Chicks that fail to adapt to their environment and are delayed in finding feed and water will die at 4 or 5 days of age when the yolk sac is depleted. Observe chick behaviour to determine if the temperature is correct. Chicks should be uniformly distributed in the cage. Closely grouped chicks indicate low temperatures or excessive drafts. Chilled chicks will make a distressed noise. Chicks that are too warm will appear lethargic .Both heat and cold-distressed chicks can have pasty vents.



BEAK TRIMMING

The W-36 pullet should be beak trimmed at 10 to 14 days of age with a precision beak trimmer using a template with guide holes appropriate for different sized chicks, and providing 2 seconds cauterization time.

CAUTERIZING BLADE (595°C, CHERRY RED COLOR)

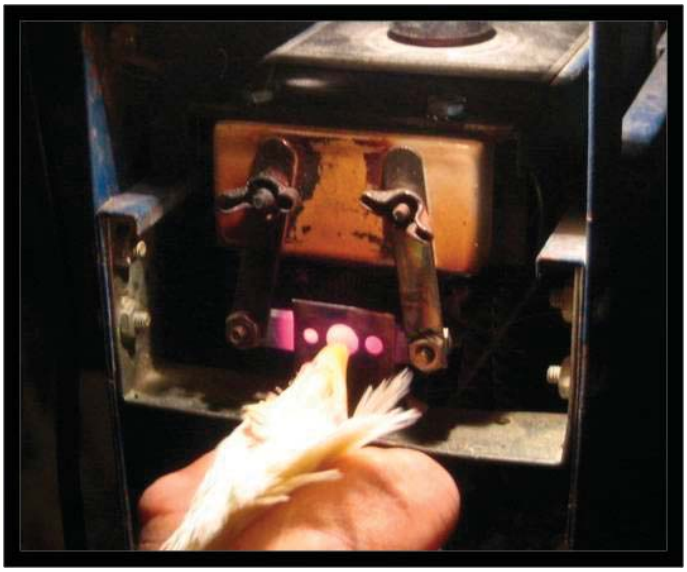


Guide holes correspond to different size and age of chicks

- 4.00 mm
- 4.37 mm
- 4.75 mm

TEMPLATE WITH GUIDE HOLES

Cauterizing Blade Color Indicates Temperature



< 595°C

When cauterizing blade is not hot enough, the beak will grow back again.

595°C

Proper trim at correct temperature.

> 595°C

If cauterizing blade is too hot, these sort of bubbles form.

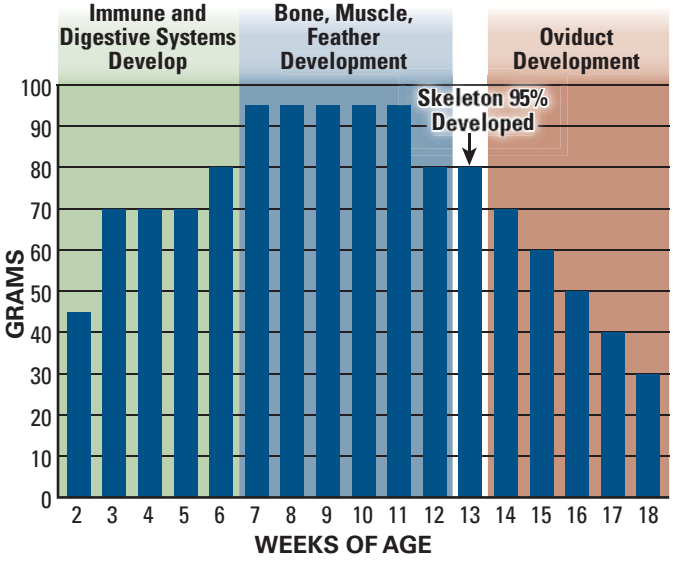
PULLET VACCINATIONS

Good immunity against Marek's, Infectious bursal disease, Raniket, bronchitis, pox and AE is required for all laying flocks. Depending on the local disease challenge additional vaccinations against infectious largyngotracheitis, mycoplasma, fowl cholera and infectious coryza may be also be needed. Consult with local veterinarians and your Hy-Line distributor for the best vaccination program from your pullet flocks.

PULLET DEVELOPMENT AND WEIGHT

The pullet develops according to a well orchestrated sequence of physiologic events. Pullets reaching or exceeding breed body weight targets during these developmental phases have the best chance to perform to genetic potential as layers. Interrupted growth during any of these developmental phases will result in hens lacking the body reserves and organ function to sustain high production as adult layers.

Weekly Weight Gain



The growing period can be divided into the following periods:

0 TO 6 WEEKS OF AGE

During this period, the organs of the digestive tract (supply organs) and the immune system undergo much of their development. Problems during this period could have permanent negative effects on the function of these systems. Birds stressed during this period might have lifelong disability in digestion and the absorption of feed nutrients. Immunosuppression could also result from problems during this period leaving the bird more susceptible to disease and less responsive to vaccinations.

Key Management Practices:

1. Good start for chicks in the brooding period
2. Maintaining ideal brooding temperature and humidity. Adjusting the brooding set up based on seasonal and climatic variation
3. Good quality feed - crumbs and free of toxins
4. Single time perfect beak trimming
5. Follow the recommended nutritional specification in the manual
6. Implement water sanitation program to ensure clean water for birds
7. Follow the lighting schedule
8. Avoid over-crowding
9. Timely shifting is necessary from brooding cages to growing cages
10. Monitor feed intake and weekly body weight gain closely. Take immediate action if either feed intake or body weight are less than standards

6 TO 12 WEEKS OF AGE

This period of rapid growth is when the pullet attains most of the adult structural components (muscles, bones and feathers). The skeleton is 95% developed by the end of the 13th week of life. At this time the growth plates of the long bones calcify and no further increases in bone size can occur. Any compensatory growth occurring after this period will not increase the size of the skeleton. The amount of mineral reserve available for egg shell formation is directly related to the hen's skeleton size. Poor growth

during this period will prevent the pullet from attaining sufficient bone and muscle reserves needed to sustain a high level of egg production and maintain good shell quality. Reactive vaccinations, beak trimming, bird handling, high environmental temperatures and other stressful management practices can delay development during this period of rapid growth.

Key Management Practices:

1. Provide adequate cage space and feeder space
2. Monitor feed consumption and adjust nutrient intake wherever required
3. Follow recommended lighting schedule
4. Water sanitation needs to be continued in this phase and throughout the lifecycle
5. It's preferable to have the same drinking system in brooding and growing sheds which enables the birds to settle easily upon shifting to the sheds

12 TO 18 WEEKS OF AGE

During this period the growth rate slows and the reproductive tract matures and prepares for egg production. Development of muscle continues and proliferation of fat cells occurs in this period. Excessive body weight gain during this period can result in pullets with an excessive amount of fat pad. Low body weights and stressful events during this time can delay the onset of egg production. Medullary bone is a readily available source of calcium for egg shell formation. Start feeding Pre-lay Diet with 2.5% calcium level 7–10 days prior to laying of the first egg to increase the medullary bone within the cavities of long bones.

Key Management Practices:

1. Pullets need to be shifted to production shed before 16 weeks of age
2. Avoid overcrowding and provide adequate cage space and feeding space
3. Regularly check the nutrient intake of birds during this period. Any reduced consumption of vital nutrients like protein, amino acids, vitamins and minerals may affect the future production performance of the flock.
4. Complete the entire vaccine schedule 3 weeks before onset of production
5. Do not start Pre-Lay diet before 15 weeks of age and the calcium content must not exceed 2.5%
6. Production sheds need to have higher light intensity than growing sheds
7. Provide light stimulation when the target body weight is attained
8. Grading of flocks - Separation of small birds must be done regularly

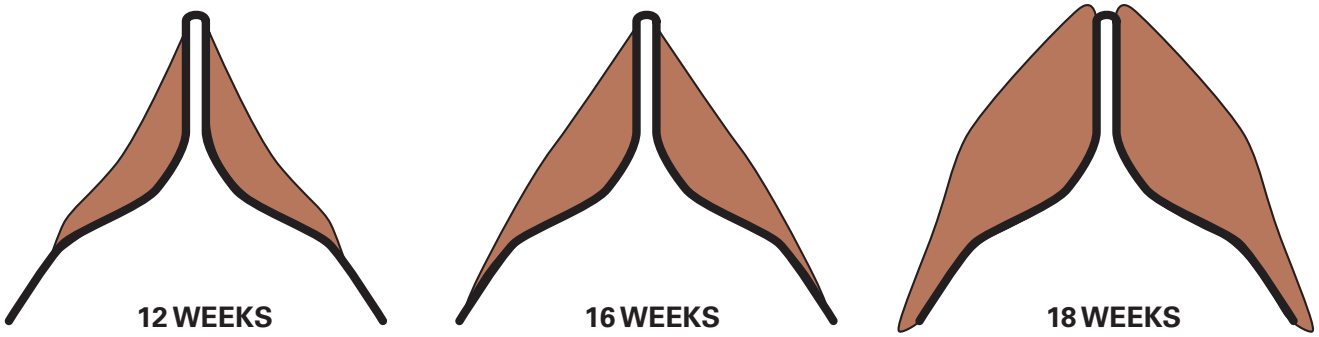
Target Body Weights at Critical Points of Development for Hy-Line W-36

6 WEEKS **Development of immune and digestive systems**	420 g
12 WEEKS **Development of skeleton and muscle**	960 g
17 WEEKS **Determines the egg weight curve**	1250 g
40 WEEKS **Evaluates adequacy of layer nutrition**	1540 g

BREAST MUSCLE DEVELOPMENT

Pullets should be examined for breast muscle development as a good indicator of proper pullet development and a predictor of future layer productivity. Muscle contains glycogen, a rapidly available source of energy used for egg production. Pullets coming into egg production with insufficient muscle will not have sufficient energy available to sustain high egg production.

Proper Breast Muscle Development

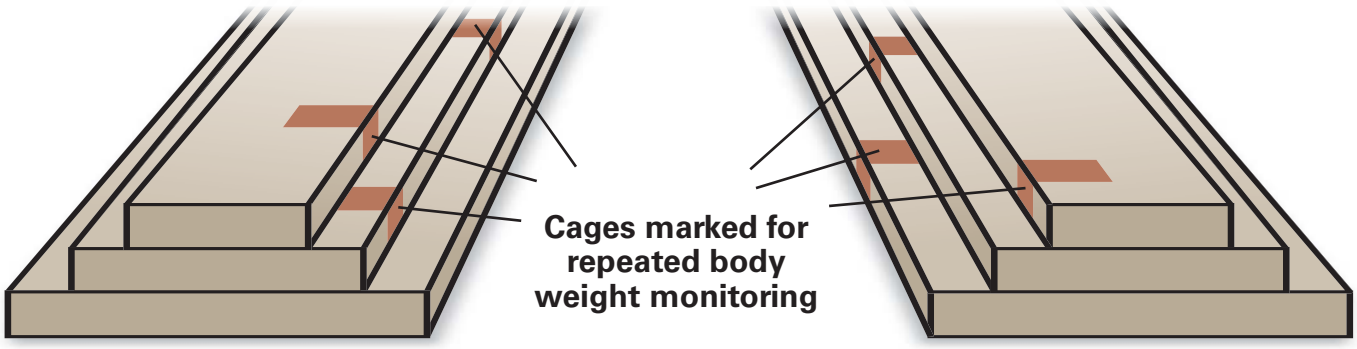


BODY WEIGHT MONITORING

A weight monitoring program should begin when the flock is 1 week old. During the first 4 weeks when the birds are still small, bulk weigh random samples of 20 birds. After 4 weeks of age, individual bird body weights should taken weekly from at least 100 birds. Continue weighing weekly until mature body size is reached at 32 weeks, then at least every 2 weeks during the remainder of the production period. For pullet flocks raised in cages, a selection of cages from all levels and positions within the shed should be marked (as shown in the picture below). All the birds in these cages should be weighed separately with the birds from the same cages weighed every week. Select cages at the beginning and end of feed lines, as well as from upper and lower levels.

Weekly monitoring of body weights is preferable as the producer can identify growth problems quickly. It might be possible to associate the growth problem with a change of feed or a stressful management practice, allowing corrective action to be taken.

Random Sampling of Birds for Body Weights



Weigh birds prior to a scheduled change in feed formulation, such as from starter to grower feed. Scheduled changes in feed formulations should always be based on achieving target body weights and not the age of the flock. Underweight pullet flocks or flocks with poor uniformity should be retained on the more nutrient rich formulation (i.e. starter feed). Flocks scheduled to receive a harsh vaccination involving handling the birds for injection should be placed back on more concentrated feed formulations to compensate for loss of appetite.

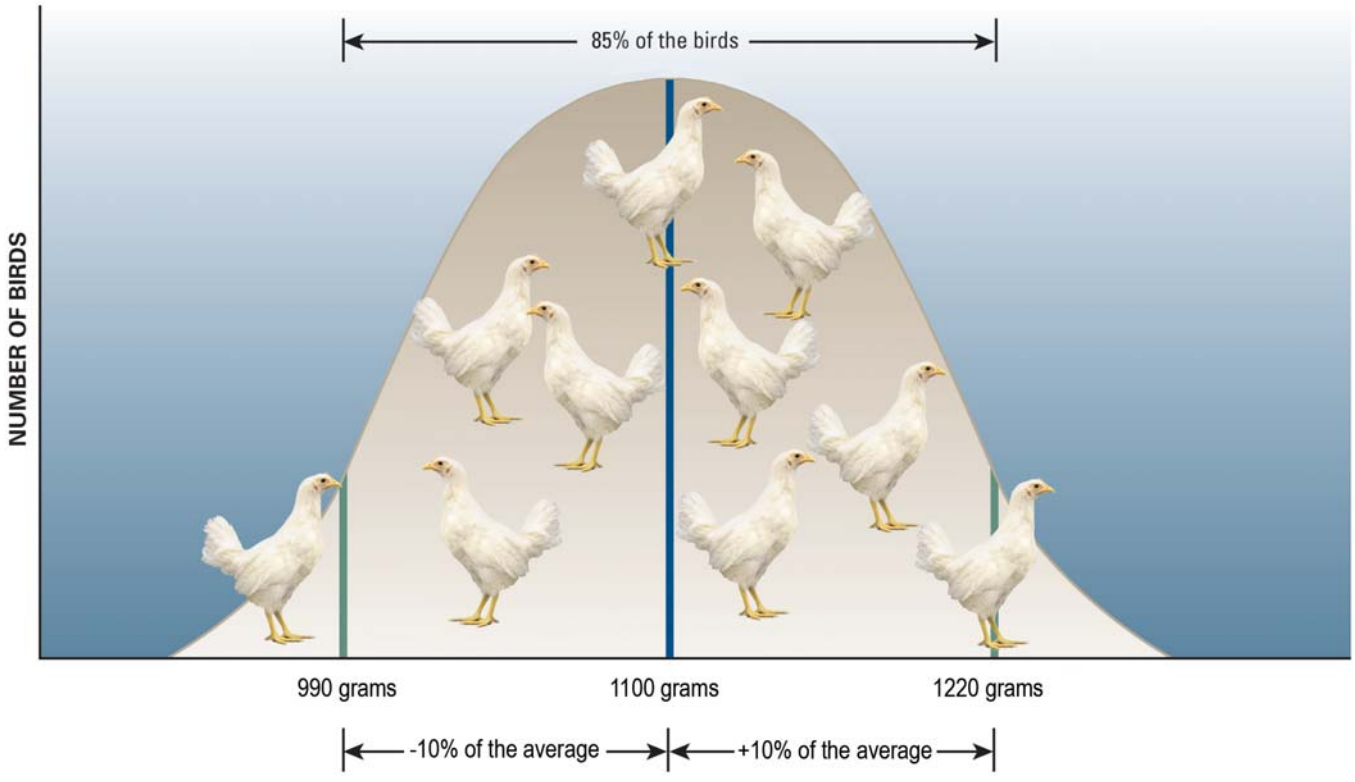
BODY WEIGHT UNIFORMITY

Uniformity of pullet body weights within a flock is an important predictor of future layer performance. Uniformity of 85% is the goal during the growing period (85% of the individual bird weights are within 10% of the average). Good pullet body weight uniformity simplifies proper feeding of the flock, both in growing and laying periods. Uniform pullet flocks come into egg production at the same time which maximizes peak egg production and minimizes the number of pullet eggs (eggs <45 grams).

Improve pullet bodyweight uniformity by:

1. Prevention of enteric diseases such as coccidiosis, infectious bursal disease (Gumboro, IBD), spirochetosis, viral or bacterial enteritis, runting/stunting
2. Proper cage bird densities. Overcrowding cages causes competition at feeders and drinkers
3. Adequate feed formulation where feed formulation is matched with actual feed intake. (Remember that W-36 has the lowest feed consumption of all breeds)
4. Providing good quality feed free of mycotoxins. Avoid abrupt changes in feed ingredients that disrupt normal intestinal microflora
5. Feed management: Four feedings and three feed stimulations per day; Allow feeder to be emptied daily for maximum 1 hour to prevent accumulation of fine feed.
6. Minimize bird stress from vaccination, excessive number of bird handlings, heat stress
7. Good beak trimming technique, one time at 10 to 14 days of age.
8. Water must be freely available at all times. Water restriction reduces feedconsumption and reduces growth and development of the pullet. Causes of water intake problems include overcrowding or equipment failure and improper height of drinkers.

Good Body Weight Uniformity Goal – Example at 8 Weeks



Target Body Weights for Hy-Line W-36

Age in Weeks	Grams
1	65
2	115
3	180
4	250
5	330
6	420
7	510
8	600
9	690
10	790

Age in Weeks	Grams
11	880
12	960
13	1030
14	1100
15	1170
16	1210
17	1250
18	1280
19	1340
20	1380

NUTRITIONAL CARE WHILE GROWING HY-LINE PULLETS

1. Feeding starter diet as crumbles can improve body weight gain and uniformity by increasing feed consumption and avoiding selective feeding
2. Follow the recommended nutritional specification provided in the manual
3. Change in diet type must be based on body weight and not based on age

Recommended Body Weights for Diet Change

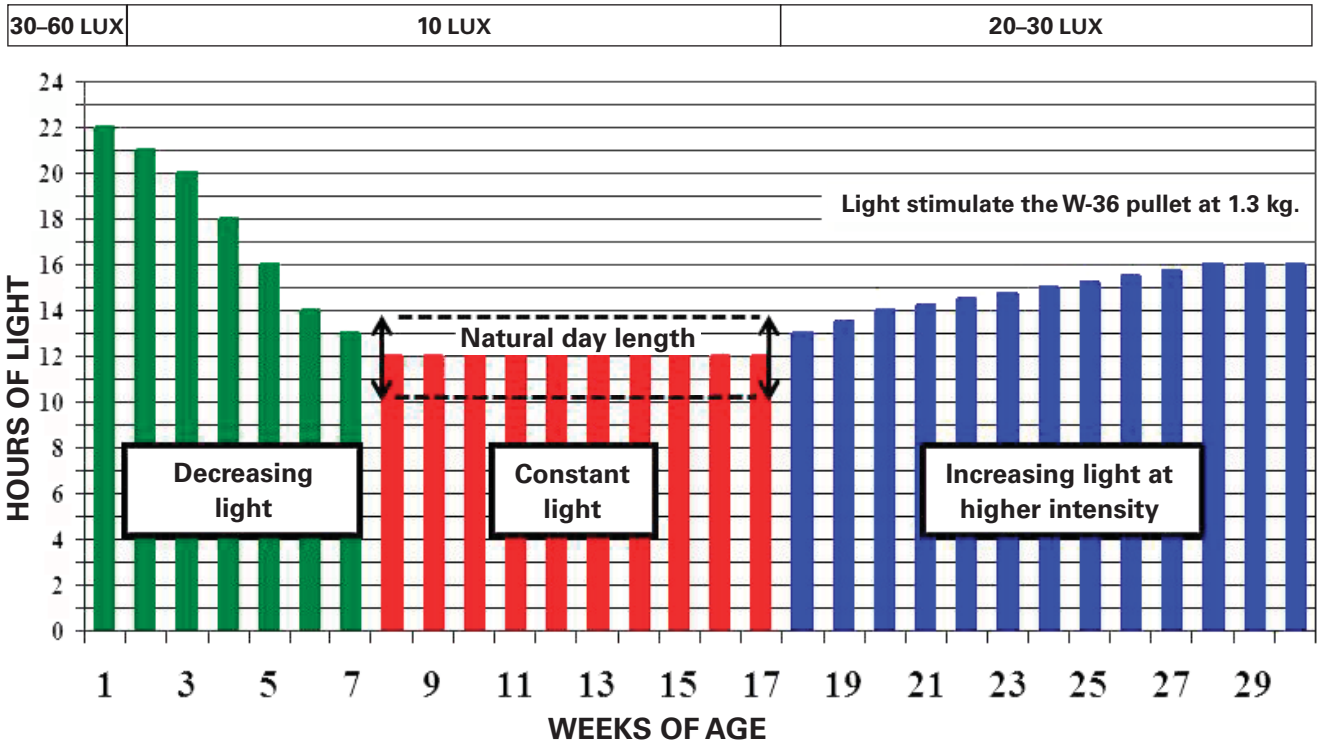
	Starter 1	Starter 2	Grower	Developer	Pre-Lay
Feed to a body weight of	180 g	420 g	960 g	1170 g	1250 g
Approximate age	0–3 weeks	4–6 weeks	7–12 weeks	13–15 weeks	16–17 weeks

4. Use of good quality ingredients that are free from mycotoxins helps in good growth and flock uniformity
5. Do not use higher calcium levels than specified in diet
6. Use limestone powder as calcium source during brooding and growing periods. Use of calcium grits is discouraged until 15 weeks of age
7. Midnight feeding can be used to increase feed intake and body weight gain is especially beneficial in hot weather
8. Too large of feed particle size affects the feed intake and growth of the birds during the brooding and growing period. Keep a uniform feed particle size of 2–3 mm

LIGHTING PROGRAM FOR HY-LINE W-36

In Hy-Line's recommended lighting program, the hours of light are gradually decreased over the first 7 weeks. This provides the young growing flock additional hours of feeding time to promote growth. In open housing, the artificial lighting programs must complement the natural day length. After the initial step-down in lights over the first 7 weeks, the artificial lights are set to the longest natural day length the flock will experience during the growing period. This change will negate the influence that changes in natural day length would have on pullet development and the age of first egg. A lighting program web tool is available at www.hyline.com that provides a customized lighting program for many locations in India.

LIGHTING PROGRAM FOR HY-LINE W-36 (OPEN HOUSING)



Weeks of Age	Hours of Light	Artificial Light Intensity (Lux)
1	22:00	30–60
2	21:00	10
3	20:00	10
4	18:00	10
5	16:00	10
6	14:00	10
7	13:00	10

Weeks of Age	Hours of Light	Natural Light Intensity
8	12:00	
9	12:00	
10	12:00	
11	12:00	
12	12:00	
13	12:00	
14	12:00	
15	12:00	
16	12:00	
17	12:00	

Weeks of Age	Hours of Light	Artificial Light Intensity (Lux)
18	13:00	20–30
19	13:30	20–30
20	14:00	20–30
21	14:15	20–30
22	14:30	20–30
23	14:45	20–30
24	15:00	20–30
25	15:15	20–30
26	15:30	20–30
27	15:45	20–30
28	16:00	20–30
29	16:00	20–30
30	16:00	20–30

Key Management Practices

1. Do not give continuous light for chicks during the brooding and growing period
2. Regularly clean the bulbs and replace worn out bulbs
3. Maintain uniform light intensity in the shed and avoid dark pockets
4. The light intensity in the brooding and growing sheds must be kept lower than the light intensity in laying sheds
5. Light stimulate the birds when they reach target body weight of 1250 g rather than stimulating based on age

CONCLUSION

Careful attention to the principles of pullet management is fundamental for success and profits in laying flocks. Growing a pullet flock of the correct weight and body conformation will usually ensure success in the laying period. Problems such as low egg numbers and poor egg shell quality during lay can often be traced back to problems occurring in the growing period.

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