Product Update

Hy-Line®

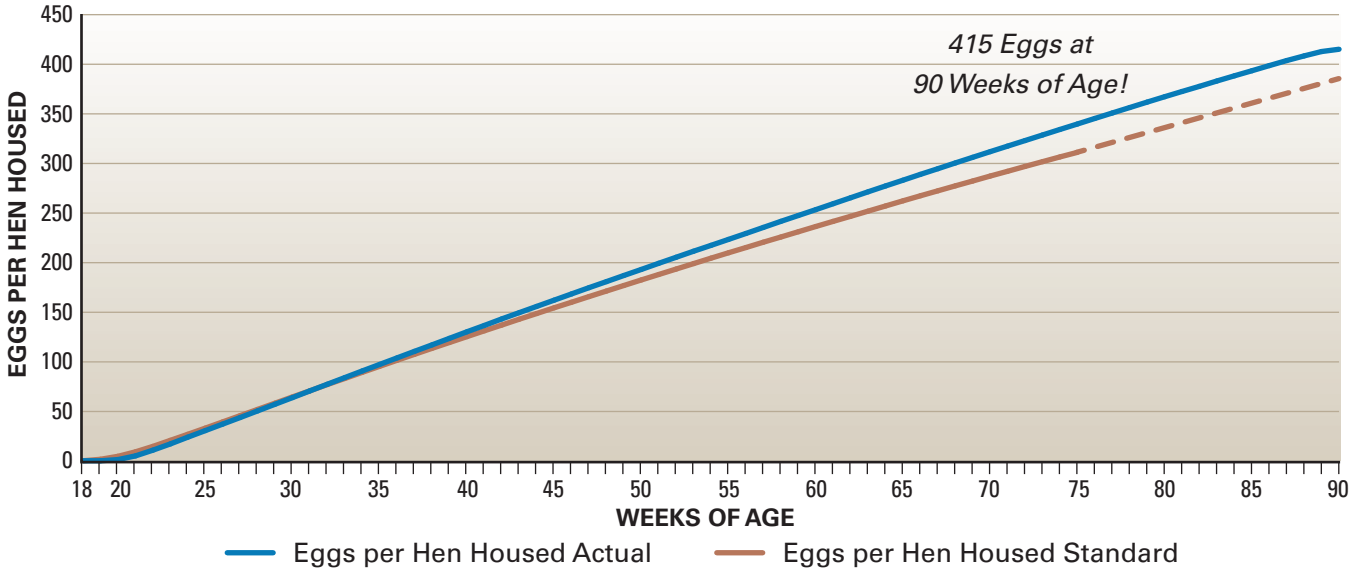
W-36

MANAGING THE HY-LINE W-36 COMMERCIAL LAYER IN A SINGLE LAY CYCLE

OVERVIEW

Simple economics have convinced a growing number of egg producers to implement a single lay cycle program. Traditionally, molting programs provided producers an advantage by allowing hens to regress their reproductive tract and build up their calcium reserves in order to efficiently produce eggs past 70 weeks of age. Concerns for animal welfare and genetic improvements in hen production traits have enhanced the modern layer's persistency of lay, reducing the advantages of molting flocks. Depending on market economics, producers may determine that molting programs are no longer economically advantageous. Single cycle lay programs now typically keep flocks in continuous production to 85-90 weeks of age.

Fig. 1 Recent Results from 150,000 Bird Flock of Hy-Line W-36



Extended laying cycles present a few challenges that can be addressed through good management during pullet rearing and optimized nutrition. Persistency of lay, egg size, and shell quality are directly correlated with these two important aspects of layer management. Controlling egg size from the onset of lay helps reduce the development of thin shells and excessive case weights later in the cycle. Additionally, adjustments to the vaccination and health programs should be considered for birds managed for a single cycle.

PULLET MANAGEMENT

As outlined in the Hy-Line Technical Update "Growing Management of Commercial Pullets," the rearing portion of a laying hen's life is critical to achieving maximum genetic potential. Uniform pullets that meet or exceed target body weights will have the frame and bone structure necessary to produce large numbers of high quality eggs.

Pullet Management Tips

Body weights

Recording accurate pullet body weights is critical to monitoring pullet maturation. During the growing period the pullets must develop the skeletal frame and soft tissue reserves needed for high egg production and persistency of lay. Pullet weights must follow the target curve as closely as possible. A pullet that reaches the correct weight at transfer to the lay house but is under target weight between 6-13 weeks may have a smaller mature frame size. A smaller frame will negatively affect her laying performance and persistency. Birds that are underweight before 6 weeks of age are likely to have poor breast muscle development which will also negatively impact productivity and persistency. Weigh pullets weekly, starting at 3 weeks of age. Weigh at least 100 birds, or at least 3 full cages in 3 different locations in the house. Always weigh a full cage and the same cages every week. Continue weekly body weights until 32 weeks of age, and then weigh at least every 2-4 weeks.

Bird space

Space per bird in pullet rearing has a major effect on bird weight and maturation. Allowing adequate space for each pullet to eat and drink efficiently will help pullets reach target body weights and achieve uniformity above 90% at point of lay.

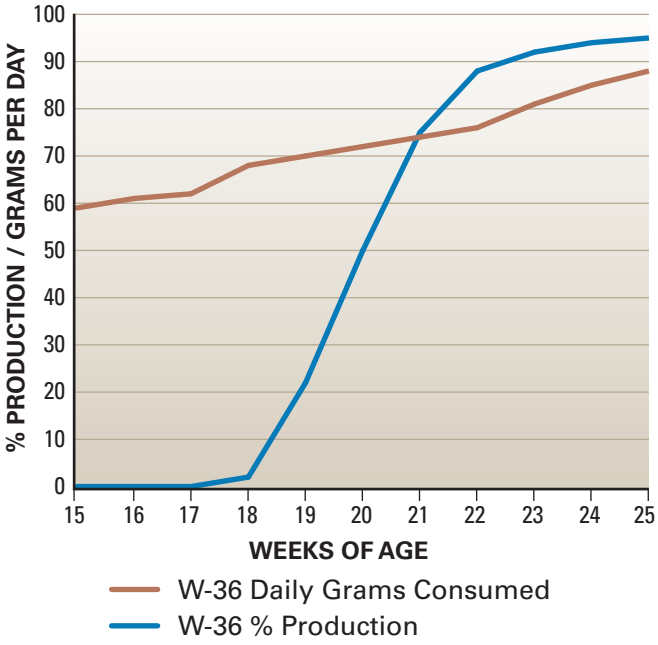
Lighting

Slower step-down lighting programs counteract or prevent early maturity of pullets, especially in flocks that come into lay during spring and summer. Extending the light step-down program to weeks 12 or 13 of the growing period (instead of the traditional weeks 7 or 8) helps increase body weights and prepares the pullets for the stress of onset and peak of lay. Adjusting lighting in this manner may result in heavier egg weights and reduced egg numbers in production, so it must be used appropriately depending on the egg weight profile required by the market.

Vaccination/Health Programs

Pullet vaccinations and flock services should be timed to avoid periods of rapid growth (between 5 and 12 weeks of age). Vaccine reactions, especially from inactivated vaccines, can reduce bird appetite having a negative impact on body weight gains. A pullet's muscle reserves can be converted into energy for egg production, which is important because feed intake will often lag behind caloric requirements when birds enter peak of lay. (See Figure 2)

Fig. 2
W-36 Feed Consumption/Hen-Day % Production



Egg production increases rapidly, while feed consumption does not. This highlights the importance of feeding to consumption.

Management Tips

Midnight feedings

In any climate where pullets are not consuming enough feed, a midnight feeding helps improve feed consumption. Midnight feeding can be implemented as soon as there are 7 hours of dark in the lighting schedule. The length of the midnight feeding should not exceed 2 hours with a minimum of 3 hours of darkness before and after the feeding period. Midnight

feeding may be also used in rearing to help improve body weight gains. Starting a midnight feeding a few weeks before moving pullets to the lay house helps increase and maintain feed consumption during peaking production, and may be continued as long as necessary. In temperate climates, the midnight feeding can be removed after one month of production. Midnight feedings should be gradually removed over a 3 to 4 week period to avoid disrupting the birds' circadian rhythm.

Temperature control

In houses that have adequate environmental controls, management of house temperature will influence feed consumption and can be a tool to control egg size. Temperatures of 70° F (21° C) or below will stimulate more feed consumption and can be useful in the early weeks of egg production to maximize nutrient intake, resulting egg production, and egg size. Conversely, later in production, higher temperatures of 80-85° F (26-29° C) will tend to suppress feed consumption and help maintain egg size. Care must be used when making such environmental changes. House temperature changes should be gradual, not exceeding more than 2 degrees per week. At all times efforts should be made to maintain good air quality, especially in cold weather conditions.

NUTRITION MANAGEMENT

Hy-Line geneticists continue to make great strides in improving the production characteristics of the W-36 laying hen. As genetics improve, diet formulations must also meet the metabolic demands of the bird. Increased egg numbers, earlier maturity and extended persistency of lay can only be achieved if the pullets and hens receive adequate nutrition. Nutritional deficiencies such as osteomalacia and/or osteopenia, commonly known as soft bones, are detrimental to flock livability and egg quality. Flocks with poor or inadequate nutrition also face post-peak dips in production or even layer fatigue due to depletion of body reserves. Shell size and quality are also strongly correlated with diet. It is critical to feed the W-36 layer based on the most recent Hy-Line W-36 Performance Standards Manual recommendations for nutrient levels based on daily feed consumption.

Nutritional Management Tips

Calcium source

Pullet Diets should only use fine, (<2 mm) limestone as the main calcium source. Fine powder calcium is efficiently absorbed by chicks, helping with bone growth.

Phase feeding

Pre-Lay and Peaking Diets benefit birds that come into peak production eating below necessary volumes (grams/bird or pounds/100 birds). Peaking Diets are formulated to meet the energy requirement of the birds to preserve breast muscle glycogen reserves as the birds enter production. Pre-Lay Diets condition the birds to higher calcium concentrations found in the laying diets.

The Pre-Lay Diet must be changed to the appropriate Peaking Diet (formulated for consumption) when the first egg is laid to provide necessary calcium levels for production maintenance. Also, without a Peaking Diet, these early layers will enter a negative calcium balance which will impact bone mineralization resulting in shell quality problems later in lay.

Increasing calcium particle size

Large particle calcium (2-4 mm) should be introduced in the Pre-Lay diet at a rate of 50% of the calcium provided. Large particle calcium provides slow release of calcium between feedings as the particles solubilize slowly in the gizzard and release calcium for absorption over a longer period. This is particularly important during the night time when shell calcification is occurring and the bird's demand for calcium is at its highest. The percentage of large particle limestone should be increased during the laying cycle to 65%.

Osteomalacia

Also known as "soft bones", osteomalacia is a condition commonly found in flocks that are fed diets without sufficient available phosphorus, calcium and/or vitamin D_3. It is critical to adjust the diet density to the actual feed intake of the bird to ensure sufficient consumption of available phosphorus (taking phytase into account if used) and calcium for the given stage of production. The early lay period is particularly important because a laying hen continues to build up medullary bone mass until she reaches mature body weight at around 32 weeks of age (in addition to having a high calcium requirement for egg productivity).

Flocks that develop soft bones (seen clinically as crooked keels, lameness, or abnormal gaits) in early lay will have reduced persistency and poor shell quality late in lay as they have failed to build up bone mass and may have even entered negative calcium balance in early lay. Further details on calcium balance and bone mineralization are available in the Hy-Line Technical Update "Understanding the Role of the Skeleton in Egg Production". The most recent Hy-Line W-36 Performance Standards Manual should be consulted to determine the recommended available phosphorus and calcium levels for specific periods of production and consumption levels.

Amino acids

Diets should be formulated based on limiting digestible amino acids instead of being based on total crude protein. Feeding the correct balance of amino acids will fulfill the requirement of the bird and optimize her productivity. Utilizing available synthetic amino acids in the diet allows the balance to be achieved more accurately and assists in meeting other nutrient requirements by freeing up space within the diet for other nutrients (e.g. energy and calcium). If rations are formulated based on crude protein, birds may receive an excess or deficiency of specific amino acids.

Excess protein may result in increased egg weights and high levels of uric acid in the blood, potentially having negative effects on bird performance including development of gout. One amino acid, Methionine, is attributed to exerting the greatest influence on egg size. Modifying methionine intake by changing the methionine concentration in the diet can directly impact egg weights. Deficient and imbalanced amino acids ratios will have negative effects on productivity, persistency, and body weight and may also negatively impact feather condition and bird behavior.

Dietary fat

Fat provides energy within the diet and is a particularly effective energy source during hot weather as it has a lower heat increment than energy from other sources. Fat is also a highly concentrated energy source lifting the energy level in high density diets where nutrient space is limited. A consequence of high fat diets can be larger egg size. There is some debate about if this is the result of fat per se, or the level of linoleic acid in the diet. Most vegetable oils are rich in linoleic acid. Where fats are used as energy sources, selecting high quality fats with low linoleic acid content may help to minimize the impact on egg size.

SUMMARY

Hy-Line W-36 commercial layer flocks produce well in single lay cycle production programs. In order to maximize egg numbers and to control egg size, it is critical to ensure that uniform pullets enter the lay house at recommended body weights, with a solid and fully developed skeletal frame and breast muscle. Additionally, birds should be provided with sufficient nutrients by adjusting the diet density to match feed intake in order to meet their requirements and to allow them to reach their genetic potential in all stages of life.