US commercial laying hen flocks coming into production ten days to two weeks late and six eggs behind target by peak production is a current problem that transcends genetics and geography. These flocks may have excellent livability and hen-day production, and may or may not meet breeder targets by 60 weeks of age. However, the 6 lost eggs cannot be recouped; at today’s egg prices, this is worth about 34 cents per bird.

Let’s find the six lost eggs by bringing these flocks into production on target. Focusing on the late onset of production isolates several common challenges encountered during the growing period and the transitional period until peak production.

Causes:

- Light weight pullets and/or non-uniform pullet flocks
  - Disease challenges – coccidiosis and parasites
  - Vaccine application timing and reaction
  - Beak trim, timing, healing, and severity
  - Grow space and equipment

- Poor transition from grow to lay
  - Age at move from grow to lay
  - Nutrient density
  - Improper use of pre-lay and/or pre-peak diet
  - Light stimulation timing; age and weight
  - Disease challenge after move
  - Mixing pullet flocks in the lay house
  - Change in equipment between grow and lay
  - Improper change in light intensity between grow and lay
  - Low feed intake
  - No body weight monitoring through peak
Discussion

Light weight pullets
The greatest challenge to any manager is receiving a light, non-uniform pullet. If all the pullets are uniformly light, weight can be added, stimulation delayed and the flock brought into production late with a very good peak and without long-term detrimental effects. However, when some pullets are coming into production and others still need an additional 100 grams of body weight, to adequately meet all the nutritional needs for both the egg laying hens and the growing and developing pullets within the same flock is impossible. The layer levels of calcium and phosphorus will be adequate for the hens in production, but may contribute to gout late in lay for those pullets not needing the layer level of calcium fortification. To feed levels of calcium/phosphorus for the light pullets to the entire flock will cause immediate and long-term skeletal issues for the hens in production. In this case, the nutritional needs of hens in production must be met, but the corrective action to prevent the non-uniform light weight pullet flocks is essential.

Data from multiple Diamond V Original XPC pullet field trials indicate that Original XPC-fed pullet flocks had improved feed intake, body weight uniformity, pullet body weights up to 50 grams heavier and a better feed-to-gain than control houses without Original XPC. Inclusion of this unique fermentation-based feed additive improves intestinal health, thereby resulting in improved and uniform body weights.

Some of the most obvious causes of non-uniform pullets are; coccidiosis and/or worms, vaccine strains, application and/or timing, beak trim and growing space and equipment.

Coccidiosis and worms - Having the proper coccidiosis control program is essential to produce a uniform pullet. Although cage rearing has effectively eliminated this challenge for most of the industry, it remains critical for the cage-free and organic sectors. A coccidiosis challenge can cause morbidity, with detrimental uniformity issues and elevated mortality, if not controlled properly. With the transition to belt manure removal systems, we have seen a re-insurgence in the late-pullet grow period as the older pullets can access the fecal material with the disease breaking after move and during onset of production in the adult house.

Rotation between vaccination and anti-coccidial control optimizes overall control. Maintenance of litter moisture in the range of 20 to 25% is essential for obtaining immunity from vaccination and controlling coccidiosis in floor birds. Original XPC is documented in multiple research trials to reduce the incidence of coccidial lesions and the severity of coccidial lesions post-challenge in cage-free layers and improve average daily gain in broilers. With this improvement in average daily gain, activation of the lymphocyte sub-populations were also significantly activated in the Original XPC fed broilers. By including Original XPC in the pullet ration, low coccidial challenges can more easily be handled by the pullet with minimal adverse affect and assist in improved pullet weight uniformity.

Roundworms remain a challenge for the cage-free and organic sectors. Pullet flocks should be evaluated during the growing period, and a proper control program implemented after obtaining advice from a qualified professional.

Vaccine strains, timing and application – Vaccination programs should continually be evaluated to optimize flock needs to the changing viral and bacterial challenges in your particular area. The emergence of vectored vaccines incorporated into the HVT virus enables the producer to present better viral immunity for either infectious bursal disease (IBD) or infectious laryngotracheiditis (ILT) to the chick earlier for those areas of early and high challenge. Vaccine application and strain must meet the challenge need of the flock. This is not static and requires continual evaluation. However, when the flock needs are not adequately covered, it results in morbidity, low uniformity and mortality. These challenges can be associated with, but not limited
to, infectious bronchitis (IB), IBD, pox and ILT. Again, the use of a layer health professional for developing programs is advised.

**Beak trim, timing and severity** – Even with more space, whether in cage-free, organic, or enriched cages, the proper trim for genetics and environment is essential as cannibalism continues to be a major problem. Some flocks are too severely trimmed for the low intensity, low stress environment which negatively affects flock uniformity, and essentially delays onset of production. Likewise, excessively long beaks cause elevated mortality in the cage-free and organic systems, and contribute to feed wastage in all operations. Monitoring, adjusting, and assuring a uniform beak trim is essential to produce a uniform pullet. The severity of the trim is dependent upon the genetics and the environment, but each flock needs to be uniformly trimmed if you are to achieve uniform growth rates. Proper temperature of the beak trim blades is also an important consideration, as too hot a blade will cause unhealed beaks and poor feed consumption.

**Grow space** - Following the breeder recommendations for growing space requirements is the best tool for achieving the pullet growth rate and uniformity targets. Too often, the grow units no longer match the larger lay unit modifications; therefore, densities are adjusted and high densities result. The reality is pullet quality has suffered with low body weights; 75% or less body weight uniformities contribute to the delayed onset of production and inconsistent lay persistency.

**Transitional adjustments**

**Housing age** - Moving the flock by 16 weeks of age allows the pullets to adjust to the lay unit environment and develop immunity to the pathogens present at the lay unit prior to onset of production. Delaying this move takes the hens off feed during the move and interrupts and/or delays their onset of production, costing egg numbers that can be difficult to recover.

**Nutrient density** – Uniformity of the pullet flocks is critical for proper ration selection. Many companies use a pre-lay ration which increases the calcium/phosphorus levels intermittently between the pullet level and first lay ration, and transitions the amino acid and energy level nearer the layer ration. Pre-lay rations are designed to be fed for one to two weeks prior to first egg. With most strains of layers, this means feeding from 15 to 17 weeks of age. Some producers use a pre-peak ration taking the calcium/phosphorus levels to layer specifications, and maintaining a slightly lower amino acid profile before going onto the peaking ration. It is essential to manage these transitional rations to the flock needs and move the well-producing flocks, on weight, to the peaking ration. To delay and hold too long on the pre-lay and/or the pre-peak ration slows the flock and several eggs are lost. Even if the pullet flock is on schedule at 16 weeks, the onset of production can be delayed with excessive transitional nutrition.

During the onset of production, there is a significant increase in nutritional requirement as the oviduct is growing and onset of production starts. It is during this time that the hen must continue adding body weight in the form of reproductive tissue plus muscling. To sustain both a high rate of production and the increases in body mass, nutrient demand is high. Original XPC optimizes gut morphology for improved nutrient absorption, balances the gut microbiota and the immune system to optimize immune response. During this transitional period, the young hen is under high stress with the onset of maturity and production. Original XPC can be an essential tool to minimize stress and maximize the needed production responses.

**Light stimulation** – Light stimulation is directly dependent upon the pullet weight and uniformity in relation to the genetic targets. If the flock is behind the breeder weight targets, light stimulation must be delayed until the flock reaches the target weight and/or the age threshold for stimulation. These weights and ages should be determined beforehand so that onset of production is not delayed longer than necessary. Body weights should be taken weekly in the lay unit during this transitional period, and more often as needed to light-stimulate the flock as soon as it hits target.
Mixed pullet sources in one lay barn – Layer flocks from one pullet source have a higher probability for success than layer flocks from mixed pullet sources. Mixed pullet sources bring with them a different bacterial and viral exposure, especially when they come from completely different geographical locations. The vaccination schedule may be identical, but the virus carried by the pullets may differ from one geographical location to another. For example, a variant bronchitis virus can be carried by a pullet flock from one area and be spread to the pullets from another source. The naïve pullets will suffer upper respiratory, urologic, or reproductive damage.

Summary - Finding six lost eggs begins on day one in the pullet house, and continues through the pullet-to-layer transition in the laying barn. If the producer is concentrating their efforts solely in the lay barn, they may never find the six lost eggs. Focus must be directed to pullet quality and uniformity. Transitional nutrition and lighting certainly play a role in achieving on-time egg production, but pullet uniformity is critical. It is difficult to meet the nutritional and light stimulation needs of laying hens and developing pullets within the same flock. To attain and sustain the expected peaking numbers and persistency requires a uniform flock of pullets that can be light stimulated on schedule, and fed to meet their onset of production and peak production needs. Original XPC is beneficial in both the pullet growing and transitional lay periods.
