

Encouraging Hens To Lay In Nests and Minimizing Floor and Slat Egg Problems

Mickey Aglio
Technical Manager
Aviagen NA

Floor and slat eggs have become a common problem in many areas. Understanding the reason for these eggs being laid outside of nests and what can be done to minimize them is important. Because many companies now utilize the blackout rearing system, they have changed from "brood-grow-lay" systems to "brood-grow and move" [to lay houses] systems. This means that growers are now more specialized in either brooding and growing or production. This specialization should lead to better breeder management and performance.

Most meat-type chicken breeders today are grown completely sex separate. The social interaction of females and males in the lay house now becomes a factor. The male - female ratio and the level of sexual maturity of both the females and males can affect nest use. Most breeding companies recommend maintaining male - female ratio of 1:9. Males mixed for mating should be the same age, properly sized and conditioned to dominate females. When placed in the production houses, males tend to prefer the floor litter area in conventional one third – two-thirds slat houses. If for some reason the males are younger, in poor condition or smaller than the females, female aggression can occur, resulting in increased floor and slat eggs as well as poor fertility. When properly prepared, males become a factor helping to discourage females from nesting in the floor litter area.

House Preparation

It is generally accepted that there are certain preparations that must be made prior to the arrival of chicks into brooding facilities. Quite simply, properly prepared brooding housing must be comfortable and contain clean water and fresh feed to ensure chick survival.

Like the brooding facilities, production housing should also have minimum conditions to ensure comfort and optimum production. All equipment should be installed and operational, including the ventilation, feeders and watering systems. In most cases feeders and waterers are located on slats. Males are usually fed separately and need to find their own feed. Manual egg collection nests should be properly bedded and ready. Mechanical gathering systems should be operational as soon after the birds are moved into the house so that collection belts can be run to acclimate birds to their operation and noise well before the onset of production.

With brood-grow-lay facilities, the growing facilities must be transitionalized into a timely proper production facility. All production equipment, especially the nests must be prepared well before the expected onset of production.

Feeding and Watering

If a water restriction program is employed, water should be made available to the flock at the same time, or slightly before the lights are turned on in the morning. Water should be available throughout the feeding period, in most cases throughout the morning, and should coincide with the most active laying period. Late watering may draw hens off nests and they can "drop eggs" as they seek water.

Birds should be fed about 30 minutes after the watering and lighting, usually females a few minutes before the males. If a second quantity of feed is required, it should be scheduled to run as early as possible and before the initial quantity is consumed in order to provide a single continuous daily feeding. Two daily feedings should be avoided especially after hens go to the nests. Young hens are attracted to the feeders, so they leave the nests to satisfy their appetite and will lay eggs at the feeders.

Most separate male feeding systems are located in the litter area in the center of the house. Male pan feeders should be raised as soon as the male feed is consumed to prevent hens from laying under them.

Bell type drinkers should be maintained at an optimum height that allows all birds to obtain water but at the same time should not become potential protected nesting sites. Nipple systems minimize this problem.

Nest Management

It is important that birds be housed at the capacity of the equipment and available floor space. Birds should not be housed based on the available floor space alone. Consider two houses equipped with mechanical egg collection systems of different widths but with the same floor space. Wider houses, more than 40 feet (12 meters) wide, tend to increase the number of hens per nest, while narrower houses, less than 40 feet (12 meters) wide, tend to decrease the number of hens per nest. The linear measurement of the house becomes the limiting factor on the number of nest holes that can be provided in houses equipped with mechanical egg gathering nests. The only way to avoid nest crowding is to add additional nest sections and reduce the passageway space between the nest units. This is not as much of a concern in houses equipped with conventional nests as increased nest space is easily added. It is strongly suggested to place no more than five and a half hens per hole for mechanical nests and four hens per nest hole for conventional nests.

Some companies have bowed to grower pressure to increase bird densities as a means of increasing grower pay while the amount of available equipment remains the same. This increases the number of hens per nest hole to a critical level, especially during the onset of production and at the peak production period. Hens do not have vacant nest holes available to them in the heavy laying periods and therefore, by necessity, lay on slats or find an alternative nesting site on the floor. This becomes especially critical in the morning hours when the demand for nest space is highest. Before the peak of production, most flocks will lay 80% or more of the day's production before 11:00 in the morning. This places a tremendous demand on nest space and tends to be the period when floor/slat eggs are the greatest.

Many times two hens will use the same nest hole. Often times eggs are ejected from the nest or broken when either or both hens leave the nest. After production peaks, the daily laying cycle becomes more extended and nest demand is somewhat reduced. Crowding the capacity of the facilities can definitely increase the incidence of floor and slat eggs and lost production.

In accordance with some of the earlier recommendations, caretakers tend to delay opening nests to young birds until just before the expected first egg or after obtaining the first egg for fear of pullets fouling bedding or mechanical nest space. With intended nest space unavailable early, young hens look elsewhere for nest sites. Nesting space should be made available to pullets as early as possible, preferably as soon as moved birds become acclimated to new housing. Nest fouling can be largely discouraged by closing the nests late in the day preventing birds from roosting in the nest holes at night, and then open them before the lights come on in the morning. Most growers rebel at the thought of this extra work, and at the same time they do not hesitate to complain bitterly of the number of non-nest eggs. At least one third of the nests spaced throughout the house should be accessible immediately after the initial light stimulation period, and all nest space should be available by the 22nd week of age.

Hens tend to have an affinity for the nest holes facing the litter area and toward the middle of the house rather than the nest hole facing the curtains or walls. The demand for these preferential nest spaces further adds to the shortage of usable nest holes. This means that hens simply do not have the desired nest space when they need it.

Making the nests attractive to young hens is very important. Nests must be in good repair with sound, solid bottoms, pads or fresh clean, dry bedding material. Fouled nests and dirty egg gathering belts need to be cleaned or replaced. Nest units should be stabilized and should not rock or move when hens enter or leave the unit. Perches need to be in good repair and structurally strong enough to support the potential weight of several birds at once.

Like feeding and watering systems, stray voltage can be an unseen problem with both conventional and mechanical egg collection systems. Producers are more likely to notice the existence of stray voltage in feeders or waters more quickly by the reduced consumption. Stray voltage in nests will invisibly discourage hens from using the nests causing them to seek alternative nest sites. Like feeder and drinker systems, nests should be checked for stray voltage with a meter before the birds are housed and several times throughout the laying cycle. It is important to check mechanical nest systems while the belts are running and stopped. Chickens can detect very low amounts of electricity, as low as 3 volts.

For safety, all systems should be grounded, however, in some cases grounding can actually increase the amount of stray voltage. Grounding is not a solution. The solution to any type of stray voltage problem is to find the source of the voltage and eliminate it. In difficult situations power companies can be very helpful.

Hens seem to have an attraction for new egg collection belts on mechanical egg collection systems. The choice of single center belt or double side belt types of mechanical egg collection nests does not seem to be a major factor in acceptance by hens. Managers seem too adamant in their opinions and preference. There are mechanical advantages to each system but all things being equal, this seems to matter little to hens. Producers seem to be successful with both systems and hens seem to accept them both.

Hens appear to prefer concave-shaped, molded plastic and artificial turf nest bottoms. Some producers utilize decoy eggs to attract hens to the nests. The presence of other eggs is often a clue for a hen looking for a nest site.

Training Birds to Lay in the Nests

Slats and litter areas should be slowly walked often, starting as soon as the birds are moved into the house. The critical time for pullets to look for nest sites is in the early morning but not exclusively early mornings. When caretakers walk slowly around the slats and litter areas, it should be with the express purpose of looking for pullets that appear to be making nests. (Walking 10 to 12 times in the morning is not too often.) This may be the single proactive management tool a caretaker has to discourage hens from floor nesting. As an added benefit, flocks with lots of human activity tend to be much calmer and less flighty. Pullets looking for alternative nest sites tend to be attracted to dark or solid walls, corners, next to steps, feed room walls, next to slat fronts, under bell drinkers and nests. Caretakers should try to gently pick up pullets attempting to establish nest sites and place them in nests. Disturbing birds trying to nest discourages them from using these sites. If it is apparent that hens will continue to utilize these areas, it may be necessary to fence birds from these areas with wire netting. After being disturbed several times, pullets usually seek quieter places - hopefully the intended proper nests.

Any time a floor or slat egg is found it should be collected. Gather floor and slat eggs frequently as uncollected eggs beget more eggs. As the flock increases in production, usually the number of times a caretaker must walk his house decreases, as does the incidence of floor eggs.

Mechanical egg gathering belts should be run several times each day, even before obtaining the first egg to acclimate pullets to the sound and vibration of the equipment. A good practice is to initially run egg gathering belts slowly in conjunction with the operation of the feeders. This should be done well before the expected arrival of the first egg. This tends to help hens adjust to the sounds and vibration of operating the system. After several days the egg collection system should gradually be run more often, several times during the morning and afternoon.

Slat Management

Slat height with heavy breeders is critical, especially with the yield type hens. Slat height with mechanical egg gathering systems should be no more than 50 to 56 cm. (20 to 22 inches) high, with the nests set back from the edge of the slats 30 to 36 cm. (12 to 14 inches). Nest openings should be easily approachable to hens and may require lowering into the slat surface or with properly inclined ramps/perches. Feeder lines should be no closer than 24 inches from the front of the nest so as to not interfere with entry into the nest.

The slat height of conventional manual egg gathering systems is slightly less critical and may be increased to slightly higher levels, up to 60 cm. (24 inches), to help ease back strain on egg collection workers. Lower slats in conventional nest houses encourage birds to nest under the nests. Litter levels should be maintained at 5-8 cm (2-3 inches) deep to discourage birds from digging deep comfortable holes and laying in them. Very deep litter encourages floor hens to lay on the floor. With floor operations, conventional nests should be constructed so as to eliminate the more attractive dark space under the nests.

Fans and fogging systems should not blow forcibly and directly into the nests. Wet breezy conditions tend to discourage hens from utilizing the offending nests except in the most extreme hot weather.

Lighting Management

Today, most breeder flocks are grown in light controlled or blackout housing. Breeder pullets should not be light stimulated before 21 weeks of age and in most cases waiting until the 22nd week of age enhances sexual maturity, prevents the early onset of production and small eggs. Pullets being placed in non-light controlled production houses should not be moved until the point of increased light stimulation. At the point of light stimulation, young hens while not yet laying eggs, instinctively begin to look for attractive nest sites. The degree to which this happens tends to be influenced by the time of the year, environmental temperatures and several other factors.

Initial light stimulation should always exceed the threshold of light - 12 hours of light and 12 hours of darkness. The recommended first increase should be to 14 hours light and 10 hours of darkness. Increasing the uniform light intensity by approximately 10 times the growing intensity to at least 32 lux (3 foot candles) at bird level not only amplifies stimulation but helps to reduce living area shadows and make the darkened nests more attractive. Young hens tend to seek out these laying sites. Most of the newer halide-type lights offer more economical lighting and HPS lighting systems seem to be an advantage, especially when used in conjunction with mechanical egg gathering systems.

Evidence shows that there is no advantage to gradual pre-lighting of blackout grown pullets before the 21st week of age. In fact, gradual pre-lighting may tend to suppress and delay peaks. The recommended initial lighting is usually from 8 hours of light during the growing period to 14 hours of light at 22 weeks, followed by 1-hour weekly increases.

Evaporative pad cooling equipped houses normally need extra lights installed over the slats in front of the air inlet pad areas to brighten these normally darker areas. These additional lights should be wired into the main light clock circuit. The additional intensity will help discourage hens from laying in these normally problem areas.

Temperatures - Ventilation

There appears to be a strong correlation between the number of floor eggs, the onset of production and hen house temperature. Flocks coming into production in very warm or very cold conditions seem to lay more non-nest eggs. Chickens will seek the most comfortable conditions. Ventilation systems should be adjusted to maintain as comfortable an environment as possible. Temperatures should be ideally controlled in the 18° to 24 °C (65° to 75°F) range. Fans, foggers, tunnel ventilation and evaporative cooling all are extremely helpful. Housing and nest temperatures in excess of, or below the recommended range, can cause birds to shun nests. It is a fact that the body temperature of a hen increases up to 1°C (3°F) when laying an egg. In hot temperatures hens are reluctant to move to poorly ventilated nest spaces and prefer to remain in the more comfortable areas where the air is moving and feels cooler.

Hen house temperatures approaching 35°C (95°F) with raised humidity levels are very uncomfortable to chickens. Air movement helps chickens dissipate heat and remove water vapor (heat through respiration). When temperatures increase chickens will naturally seek areas where air temperature is even a degree or two cooler or where increased air movement makes the birds feel better. In extreme heat, more often than not the coolest temperatures are on the slats early in the morning and in the litter area later in the day. By dropping down even 50 cm (20 inches) to the floor birds can feel and will seek even as little as 2°C (1°F) drop in temperature. Rather than be exposed to the harsher temperatures, hens will lay where they are and remain cooler. Proper uniform tunnel ventilated housing with the effective use of evaporative cooling will help encourage the use of nests by hens in warm periods.

In extreme cold temperatures floor eggs can also be nearly as much of a problem as in very warm temperatures. When hen house temperatures approach freezing or below, birds will huddle together for warmth, usually in the litter area on floor and the hens will not venture to the nests. In these harsh conditions pullets and hens prefer to lay where they are and where temperatures are the most comfortable.

Hen house temperature/ventilation is the most common condition that has the greatest influence on inducing hens to use nests. Hens will always seek the most comfortable environment. If the nest conditions are uncomfortable or perceived to be threatening, hens will locate more favorable sites.

In most cases as flocks get older, they tend to lay more in the nests. It does appear that those flocks with more extreme floor/slat egg problems continue to be problem flocks throughout the laying period. The extra effort of planning, prevention and early training of pullets to lay in the nests, although not one hundred percent, seems to be the only means to help induce high production of nest laid eggs. As new management techniques and equipment is developed, new methods will be developed to attract hens to become proficient nest layers, thus producing clean high quality hatching eggs.

CHECK LIST

House length and width, and bird density are factors affecting the number of hens per nest hole. Place no more than 5.5 hens per nest hole. Exceeding this usually increases the incidence of non-nest eggs.

Maintain 2 to 3 inches (5 to 8 cm) of litter on the floor. Deep litter tends to encourage floor nesting.

Slat height should be 20 to 22 inches (50 to 56 cm) high for mechanical nests and 24 inches (61 cm) high for conventional nests.

This does not include litter.

Light intensity should be uniformly at least 3-foot candles (32 lux) at bird level with a minimum of shadows or dark areas. Center mounted HPS lights seem to be an advantage.

Provide adequate ventilation. Strive to maintain a uniform 65 to 75°F (18 to 24°C) hen house temperature as much as possible. If the hen house temperature exceeds 86°F (30°C), then air movement (convection) is important.

Mechanical nests require a clear open space 12 to 14 inches (30 to 36 cm) from the slat edge and 24 inches (61 cm) from any obstructions such as feeder lines or drinkers.

Insure nests are in good repair, and stable and do not rock or move.

Make properly prepared nests available to hens no later than the 22nd week of age.

Nests, bedding, pads and egg collection belts must be kept clean and in good repair. Birds seem to be more attracted to nests with new egg collection belts.

Initially run mechanical egg collection belts on slow speed while feeders run and then gradually several times during the day to acclimate hens to their sound and vibration well before the expected onset of production.

All nests, both mechanical and conventional should be checked for the existence of stray voltage. The required grounding is not the solution. It is imperative that the source of any stray voltage be located and eliminated.

Concave shaped molded plastic and artificial turf bottoms appears to be preferred by hens. Some producers use decoy eggs to attract hens to the nests. It is believed that the presence of other eggs in a nesting site could be a clue for a hen looking for a nest site.

As the onset of production approaches, slowly walk slats and litter area (10 to 12 times before noon is not too often) looking for birds attempting to nest outside the nests. Gently try to catch and place nesting birds into nests.

Pick up floor or slat eggs frequently.

Feed and water birds as soon as the lights are turned on each morning to reduce pulling hens from the nests.

Feed females a few minutes before the males to move females onto the slats and closer to the nests.

Raise center-mounted male pan feeders after the male feed has been consumed to discourage hens from nesting under them.

Bell type drinkers and nipples should be properly adjusted high enough to remove protected nesting sites.

Fence off particularly troublesome and attractive nesting areas (corners, fan tops or feed rooms) to prevent hens from laying in those areas. If dark areas can not be eliminated, fence them out.

Planning, prevention and early bird training in the first four or five weeks of the pre-production and early production cycle is easier than collecting floor and slat eggs, and less costly than the egg losses during the entire forty weeks of production. The economics and benefits of the extra work are well worth the effort.