CAGE-FREE LAYER HOUSING: COMMUNITY NESTS OR AVIARY SYSTEMS?

The egg industry's transition to cage-free started in 2008 when the nation's first cage-free mandate - Proposition 2 - was introduced in California. Proposition 2 specifically targets treatment of egg-laying hens, veal calves, and gestating pigs and prohibits farmers from confining animals in such a manner that "does not allow them to turn around freely, lie down, stand up, and fully extend their limbs."[5]

Initially, cage-free producers chose to use community nesting systems. Community nests provide a lot of space per bird and they are easy to manage, and they were affordable.

With cage-free demands growing and community nesting systems are inherently limited in the number of birds housed per barn, there is an emerging trend of specialty egg cage-free producers adopting the aviary system.

An aviary system is an open concept system that maximizes the use of vertical space in a hen house. The system has no doors, so birds cannot be confined, but they can move from one tier to another to find food, water, and nest boxes.

Why might an aviary be the new go-to choice? There are a few things to consider when choosing a nest. First and foremost is bird health and welfare. Second is labor and productivity. Aviary systems are designed to maximize the bird's environment by improving air quality and providing enrichment, while maximizing nesting spaces for a higher number of birds housed.

Health & Welfare

Good animal welfare in a poultry house combines nutritional standards for optimal health and an enriching environment that encourages expression of natural behaviors. Some of these natural behaviors include perching or dust bathing, foraging or nesting. Birds are motivated to perform these behaviors and will do so if given the means. These enrichments provide hens with a distraction from each other, decreasing the likelihood of feather pecking in large flocks.[11]

The ability to run, walk, and fly increases musculoskeletal strength. It also decreases the

incidence of osteoporosis and fractures, both common in laying hens due to the calcium demand of egg making.[7] In the US, hens' diets are pre-formulated for the breed and age of the hen, so farmers don't have to worry too much about the quality of the diet. They do have to have a regular feeding schedule to ensure that the birds are adequately fed and receiving the right amount of feed.

The natural byproduct of that feed, manure, has a significant impact on the air quality in the laying house. There are acceptable levels of ammonia, carbon dioxide and particulate matter (dust) that can be present in a barn before they start to have a deleterious affect on productivity and health. Having a proper ventilation program in place can help provide the necessary fresh air, but removing manure completely from the house will greatly improve the environment. Aviary systems can include manure belts for automatic removal of the majority of waste from the barn environment versus a traditional slatted nest house.

Labor & Productivity

The biggest hurdle to maximum egg output on a farm is floor eggs. Floor laying causes problems with labor and egg quality. Eggs laid on the floor increase the labor cost associated with picking them up and are often cracked or dirty. These eggs are unusable and decrease the overall profit of the operation.

If a small irritation occurs when hens are learning where to lay their eggs, they may choose an

undesirable location in which to lay their eggs. Unless quickly deterred, they continue to lay in that same location throughout their life, and other hens may start to follow suit.[9]

It's necessary to discourage floor eggs from the start. Hens prefer to lay in a dark, private nesting area. An inviting nest has a soft substrate in the bottom, is dimly lit or nearly dark, and affords some privacy from other birds. Good husbandry practices, like frequently walking the birds in the beginning of the lay period, moves the birds toward the nesting areas and away from the litter areas.[3] Aviaries and community nest houses both provide ample nesting areas for the hens with automatic egg collection. Additional aviaries allow collection of system eggs - those laid outside the nest boxes but still within the aviary structure.

Choosing A Nest

To understand why so many cage-free egg farmers are making the switch from a community nest to an aviary system, let's look at how each of these options functions in a barn, in terms of the health and welfare, labor and productivity concepts we just talked about.

Health & Welfare
Community Nesting:

Birds have ample room to perform innate behaviors in community nesting barns. Birds have litter to dust bathe and slats to jump and perch on.

Air quality is a high priority in modern day egg farming. In community nesting systems that use litter areas and slats, manure often gathers in the litter and under slats and can affect the air quality if ventilation is not properly managed.

Litter based systems have been shown to have increased levels of ammonia, carbon dioxide, dust, and bacteria.[1] Ammonia and particulate matter concentrations tend to increase as lights come on for the day and birds become more active but drop during the summer when ventilation rates are higher. The pattern is most obvious during winter months when consistent, minimum ventilation rates are used.[1]

Aviary Nesting:

Aviary systems allow barns to house larger flocks by increasing usable surface space. These vertical systems often ensure, with good husbandry of course, excellent production results and lower mortality when compared with other systems. More space per bird ensures more free ranging behaviors. Birds' natural instincts are to roost as high as possible. The vertical configuration of an aviary allows that to happen.

Aviary systems use a series of tiers and perches that keep the feed lines, water lines, and nesting boxes over a belted manure removal system. The belts allow the manure the space to dry and then remove the manure from the house. The birds can perch and roost, forage for food, and do so in an environment with lower dust and ammonia levels.[6]

Nesting spaces can be found on multiple tiers in most aviary systems. Greater access to nests reduces competition and stress surrounding egg laying. Birds in aviary systems exhibit fewer aggressive behaviors, such as feather pecking, as a result.[6]

Labor & Floor Eggs
Community Nesting:

Community nest houses require training the hens to the nests from the beginning to ensure minimal floor eggs later on. This can be accomplished by walking the hens multiple times during the day, focusing around peak lay times in the morning, to guide them firstly up to the slats and into the nests.

Randomly placed slats or perch poles throughout the rearing house beginning at eight to ten weeks will encourage birds to exhibit natural perching behaviors and reduce the likelihood of reluctance to jump onto the slats.

Labor & Floor Eggs
Aviary Nesting:

Farmers have more freedom to inspect and clean their barns when using aviary systems. The aisle ways in the center of the house between systems allows workers to view the inside of the system from the back.

More labor is needed in the first few weeks after placement. Routinely walk the house and monitor

bird health. Approximately 0.2 hours of labor per 1000 birds each day[1] is needed to make sure birds are thriving in their environment.

To limit the amount of floor eggs, birds should be training to use the system while still in the pullet house. Training pullets to jump on slats and perches before moving to the laying house helps them find nest boxes and feed and water lines when they are in the laying house. Training of the birds becomes even more important in an aviary house, as the additional need to minimize vertical density/migration issues along with training the birds to the nest boxes is present.

Due to the higher structure of aviary houses, farmers that don't train their pullets to move about in an aviary system have up to 30% more floor eggs as a result.[1] However, when birds are properly trained and maintained, floor eggs may average just 10-20 per day.

Regardless of the house design, careful and tentative husbandry is always the foundation of healthy flock performance.

1. National Research Council (US) Committee for the Update of the Guide for the Care and Use of Laboratory Animals. Guide for the Care and Use of Laboratory Animals. 8th edition. Washington (DC): National Academies Press (US); 2011. 3, Environment, Housing, and Management. Available from: https://www.ncbi.nlm.nih.gov/books/NBK54046/
2. Heinrich, Andrea, et al. Nesting behavior - a comparison of single nest boxes and family nests. Bavarian State Research Center for Agriculture. Freising, Germany. 2014.
3. Lay, D. C. et al. Hen welfare in different housing systems. Poultry Science Association. 2011.
4. Alonzo, Austin. 5 Cage-free aviary facts egg producers should know. WATTPoultry. 2016.
5. Siegner, Cathy. Cage-free egg commitments are in the spotlight - and may cost companies billions. Fooddive. 2019.
6. The best non-cage alternative: The Aviary. Poultry World. 2017.
7. AVMA. Welfare Implications of Laying Hen Housing.2012.
8. Nelsom, Diane. Examining the Effects of Hen Housing. College of Agricultural and Environmental Sciences. 2015.
9. Minimizing Floor and Slat Egg Problems. Poultry. 2007.
10. Hatcher, K. M. & Jones, B. The welfare of layer hens in cage and cage-free housing systems. World's Poultry Science Journal. 73:4, 767-782, DOI: 10.1017/S00439339417000812.
11. Xin, Hongwei, et al. A Comprehensive Assessment of Aviary Laying Hen Housing System for Egg Production in the Midwest. Agricultural and Biosystems Engineering Technical Reports and White Papers. 2012