

Multi-Tier Aviary Advantages



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By Frank Luttels, Layer Product Manager

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Advantages of Multi-Tier Aviaries in Cage-Free Egg Production

Cage-free facilities remain a dominant trend in North American egg production, driven by the growing demands of consumers, supermarkets, restaurants and others in the food supply chain. When transitioning from conventional egg production to cage-free, producers have choices, including multi-tier aviaries, combination (sometimes called “combi” or winchable platform) aviaries and floor systems. While each solution offers a unique set of benefits and challenges, many leading industry experts see multi-tier aviaries, also known as European-style or open aviaries, as the superior approach due to several key advantages of these systems:

- High bird performance
- Reduced labor requirements
- Excellent bird welfare
- Positive public perception
- Strong return on investment

Many experts see multi-tier aviaries as the superior approach to cage-free egg production.

What Are Multi-Tier Aviaries?

Some of the earliest attempts at modern aviary design date back to the 1980s in Switzerland, as European markets began developing the demand for cage-free eggs. These early systems typically included different open levels the birds could jump inside, as well as separate nests often located against a wall.

The primary disadvantage of these early systems was that bird density per square foot was very low, with each house containing only 600 to 6,000 birds. This greatly limited potential production and profits from the house. In addition to the inefficient use of space, this setup resulted in a high rate of floor eggs, though the low population of birds allowed relatively easy pickup of the eggs.

In the 1990s, producers in the Netherlands experimented with similar systems but added more birds per house – with populations often totaling from 20,000 to 25,000. This trial resulted in an even higher rate



Aviaries

+



Nests

+



Feeding
Systems

+



Drinking
Systems

+



Climate
Control

+



Egg
Collection

of floor eggs (six to 10 percent). The high percentage of floor eggs, in combination with the larger bird population, required more labor than is practical for commercial egg production.

Eventually, some egg industry pioneers began building aviary houses with integrated nests, rather than keeping the nests against a wall. They also placed the water lines in front of the nests so that birds would find the nests in their search for water. Birds performed well in this innovative system, and it became the foundation for modern multi-tier aviaries in cage-free egg production.

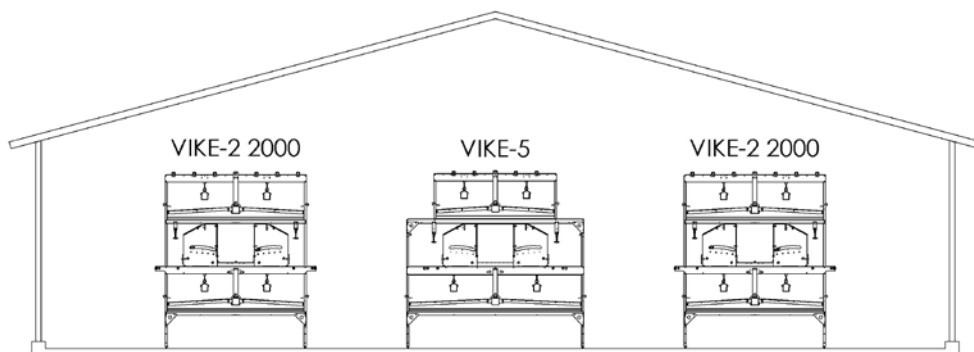
Today, producers may find a few types of multi-tier aviaries, but they are all based on the same principles. These include a bottom level, a separate nest level with water, and a top level with perches. Wire mesh floors and manure belts are located on all levels to help maintain a clean environment, while reducing the labor requirements of cleaning the aviaries. In some aviary configurations the top level is the same width as the bottom, while other configurations use a stepped design with a narrower top level. A combination of these configurations within a house is often ideal, since some birds naturally jump up within the system, while others prefer to jump across the aisle to move up to the top level.

The upper-level perches provide an area where most birds prefer to sleep. The birds naturally tend to spread out on the perches, rather than bunching up in a corner, which helps prevent the formation of hot spots and improves ventilation for a healthy climate in the house.

An example of a modern multi-tier aviary is the VIKE™ Aviary System from Chore-Time, which features a low-profile design with multiple configurations available to fit well in both new and existing poultry houses. The VIKE™ Aviary System also includes integrated VALEGO™ Nests that provide a sturdy, quiet and clean environment to promote higher egg production, while reducing labor needs. Water is provided at the bottom level of the aviary for a week and a half after birds are first introduced to the



Example of a Modern Multi-Tier Aviary House Layout



house. Then the bottom-level water is shut off so that birds locate the nests when moving to the middle tier to access water. Efficient LED lighting helps illuminate the aviaries and nests for the birds which helps to minimize floor eggs.

Chore-Time uses nipple drinkers in its systems to minimize spilling. An auger-driven feed system also increases efficiency by distributing a uniform feed ration across the entire length of the system. Birds do not eat until the auger stops moving, so chickens do not peck and consume choice morsels of feed while the feeder is running.

An innovative feature of the VIKE™ System is Rack-Drive Expulsion (RDE), which gently nudges birds out of the nests after laying eggs, preventing



Rack-Drive Expulsion (RDE) Nest Closure

hens from staying in nests all the time. The RDE System helps protect eggs while the collector is running by moving slightly away from the back of the nest so birds cannot reach eggs as the eggs go past. This maximizes the percentage of clean, grade-A eggs.

Advantages and Challenges of Multi-Tier Aviaries

The success of multi-tier aviaries in cage-free egg production is largely attributed to the way they support natural bird behavior. For instance, the layout encourages birds to jump and move around the house. Additionally, multi-tier aviaries have 50-percent of the floor area available for scratching, which meets or exceeds current cage-free standards in both the United States and the European Union. Providing ample floor space encourages birds to scratch in the afternoon after laying eggs, rather than engaging in undesired behaviors, such as feather pecking.

Because the design of multi-tier aviaries encourages birds to naturally distribute themselves throughout the house, management is kept to a minimum. Features such as wire mesh flooring and well-designed manure belts keep the aviaries and birds very clean, further reducing the amount of labor needed to maintain a hygienic environment.

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Producers benefit by being able to stock more birds per square foot in multi-tier aviaries than other cage-free system styles allow. Two-story houses can also be configured to increase the number of birds per house, which can further enhance return on investment, so long as producers take care not to overcrowd the houses. Bird performance declines in any house when stocked over the maximum recommended density.

Well-trained birds placed in a multi-tier aviary system at an appropriate density have shown good performance, even without molting – just a single cycle through 94 to 96 weeks of age. This results in more eggs per bird, a lower cost per egg, and a higher return on investment than other system types. Over a period of 10 years, for instance, producers may be able to purchase one or two flocks less than they would with under-achieving birds that are taken out after only 74 to 76 weeks of age.



Well-trained birds placed in a multi-tier aviary at an appropriate density tend to produce more eggs per bird at a lower cost per egg for a higher return on investment than other system types.

Egg quality is also optimized in multi-tier aviaries. Nests and eggs are kept cleaner in these systems, and a gentle collection system minimizes cracking, helping producers achieve the most grade-A eggs per hen.

One of the biggest barriers keeping producers from adopting multi-tier aviaries is that the cost of installation is higher than some alternative systems. However, multi-tier aviaries have demonstrated a much higher return on investment over the long term than some other systems with lower initial installation costs, due to the lower maintenance, better bird performance and higher egg quality with multi-tier aviaries.

Comparisons to Other Systems

The two main alternatives to multi-tier aviaries are floor and "combi" systems. Floor systems are often chosen for existing poultry houses with low ceilings or other space constraints, and some consider these systems to provide the most bird freedom. Also, one great appeal of converting to a floor configuration is the typically lower short-term expense. However, multi-tier aviaries offer much higher bird density without sacrificing bird welfare, providing producers with a better return over floor systems. Additionally, the multiple low-profile configurations available in multi-tier aviaries can often solve the issues of small houses and low clearances just as well as floor systems. What may be a short-term gain in cost savings with a floor system is quickly outweighed by the higher long-term performance and density benefits of a multi-tier system.

"Combi" systems were first developed in Germany in the 2000s with the goal of creating a superior alternative to multi-tier aviaries. They feature nests, feed and water on each level, based on the idea of placing less importance on training birds to move within the system. While this design offers some advantages, such as lower installation costs and decreased feed consumption due to less bird movement, it also has considerable drawbacks that may cause management issues and reduced bird performance, even though it was originally conceptualized as a low-management solution.

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A greater concern with "combi" systems, however, is the loss of egg quality. Because "combi" systems have nests on every level, these systems require more egg belts in places that tend to collect dirt, dust and other contaminants. Additionally, the "combi" design often leads to an unbalanced distribution of eggs. Because of these problems, producers frequently experience dirtier eggs, more cracked eggs, and lower egg quality in general. Some trials have shown that "combi" systems result in 10 to 30 less grade-A eggs per bird over the total production cycle than multi-tier aviaries, which greatly diminishes profitability.

Perhaps the biggest issue with "combi" systems has nothing to do with production, egg quality or labor, but rather public perception. Though these are "cage-free" systems, they still resemble traditional caged systems. When it looks like the birds are in a cage, it does not matter how much one tries to explain it, people often still see cages. Many retailers, food producers and chain restaurants see perception as reality and are putting in their contracts that they want cage-free eggs from multi-tier style aviaries, not "combi" systems. In fact, for this reason alone, "combi" systems are already rejected by many European producers today.

The advantages of multi-tier aviaries in cage-free egg production are that they offer long-term viability and the greatest potential for long-term profitability. Not only do these systems benefit bird welfare by encouraging natural bird behaviors and movement throughout the house, but producers also benefit from reduced labor requirements, lower cost per egg and increased number of grade-A eggs per bird. These many benefits beg the question, if multi-tier aviaries are comparably more advantageous than floor or "combi" houses, then why are they not being used by every producer? Some of this is due to the mindset of traditional cage production. In such systems, it all came down to building costs per bird. Density in such houses are maximized, so the cheaper, the better. Thus, a producer converting from a traditional caged to a cage-free system may still be focused on the highest density at the lowest possible cost and, without considering other factors, that points to a "combi" system.

Cage-Free Egg Production System Comparison*

	Egg Quality	Bird Density	Short-Term Expense	Return on Investment
Multi-Tier Aviaries	Better	Higher	Higher	Better
Floor Systems	Good	Much Lower	Lower	Lower
"Combi" Systems	Lower	Higher	Higher	Lower

*Individual results may vary depending on a variety of factors.

As with most industries, change takes time. Additionally, change tends to happen after others pioneer new technologies and the advantages become clear to everyone. The positive experiences in Europe will continue to drive acceptance in North America. And as more and more producers convert to multi-tier aviaries, and it is repeatedly seen how these facilities produce more, high-quality eggs, with less labor, and without the public perception problems, it is only a matter of time before this "new" multi-tier approach becomes the standard.



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