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Popular Article

Management of nest box for enhancing egg production in the backyard and deep litter system of poultry production

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Introduction

Many egg producers have moved to more cage-free table egg production systems. In cage-free facilities, the nesting behaviour of hens is an important economic trait. Backyard chickens and layers primarily reared in deep litter systems, possess many management challenges in egg production viz. floor laying, egg eating, egg breaking and soiling resulting in poor economic associated with production losses, poor egg quality and increased labour requirements in egg collection. In the field conditions, the incidence of floor eggs depends on factors related to birds, environment, nest training, and management practices. Chicken needs a dark and cozy place to lay their eggs. Nests containing loose material, such as wood shavings, rice husk or straw are preferred, and hens express more nest-building behaviours.

The management challenge for poultry farmers is to finish alternative nesting sites where hens might lay out-of-nest eggs. To mitigate these issues, the management of a well-designed nest box is crucial in increasing poultry production.

Features of the nest box

- 1. Perch:** It is easier for hens to enter in and exit out of nest boxes if they have perch on before and after they lay.
- 2. Sloping roof:** Sloping roofs prevent birds from using nest boxes as rest or defecation places.



- 3. Roll away design:** Roll away design of the nest box causes the egg to roll down toward the rear side preferably and makes it unavailable for the chicken to eat it. Thus, it prevents egg-eating behaviour.
- 4. Access to the nest box from the rear:** It is more convenient to gather eggs from the back. For this purpose, nest boxes have a latch at the back for easy access.

Material for nest boxes: Nest boxes can be made up of a variety of materials. Each material has its own merits and demerits. The ease of cleaning, price and durability should be considered.



Figure 1: Triangular roll-away nest kept in the deep litter system.

Nest box utility according to the situation

- **More frequency of egg collection:** Eggs need to be collected very regularly to prevent them from becoming soiled, to prevent any would-be broody hen from sitting on them and to prevent their damage due to rodents.
- **Less frequency of egg collection:** The roll-away design would probably be best. It keeps the eggs away from the hens and prevents damage, dirt and pecking.

Management during growing phase

Training: Training hens for good nesting behaviour starts during their growing phase. Pullets reared in a laying shed adapt faster after transfer to a laying shed, with fewer floor eggs than floor-reared pullets (Colson et al., 2008).

Perches: Perches should be present in the rearing flock by 10 days of age to develop playing behaviour in the young pullets and strength in the leg and breast muscles. The use of perches acts as a resting place for chickens and decreases the stocking density of chickens on the floor.

Considerations during transfer: Transfer pullet flocks to the laying facility by 14 weeks of age or before the first eggs. During this time, chickens will get sufficient time to adapt themselves and will maintain a pecking order. In the morning time, birds should be manually placed in the nest box, if found roaming outside and nest box should remain open for examination by birds.



Management during the laying period

Training period: The nest training period begins from the pre-laying phase and goes up to stage of the peak of egg production (around 27–32 weeks). In this time interval, pre-laying birds will learn to use the nest box provided in the shed. During the training period, the farm manager should visit the flock at least 6 times a day and should discourage birds from sitting on sites other than nest boxes. Floor eggs should be collected frequently and placed in the nest box, which will ultimately attract birds to visit the nest box. Destroy any possible sites suitable for natural nesting such as corner sites, along the wall, etc. The optimum house temperature and good air circulation keep the hens active and discourage floor eggs.

Nest opening and closing: Nest box opening time should be 2 hours before lights on and closing time should be 2 hours before lights off. In natural lighting conditions, nest boxes should be closed 1 hour before dusk.

Alternative nesting sites: Corners of the shed and along the walls are potential sites for nesting by birds. It can be removed by rounding the corners and using electric deterrent wire along the walls. Sheds should be well-lit except at the location of nest boxes.

Electric deterrent wires: Electric deterrent wires along the wall, if allowed will prevent floor eggs. These wires will keep birds away from walls and corners, which will discourage any nesting behaviour along them. The use of electric deterrent wire is more important in the training period of the birds. We can remove it after birds start using nest boxes continuously.

Nest usage: We assume that all the birds will utilize nest boxes evenly. But normally this does not happen. Hens use some nest boxes preferably than others, depending on their location in the shed. It prefers the corner and end line of nest boxes, which causes overcrowding in some nest boxes and others remaining less utilized. This situation may cause dirty eggs and their breakage. To minimize this kind of behaviour in laying birds, we can partition the flock into different groups for even distribution of birds in the nest boxes.

Egg collection: Most of the eggs are laid in nest boxes between 5 to 6 hours after the lights are turned on in the morning. During this time, most of the nest boxes are occupied (Lentifer et al., 2011; Oliveira et al., 2016; Riber, 2010 and Rinnenberg et al., 2014). We should not disturb birds during this time and egg collection should be done after it.

Litter: The depth of the litter material should be less than 2 inches, otherwise it will encourage birds to lay more floor eggs. Periodically, extra litter material should be removed from the shed and rake it properly.

Ventilation: The nesting site should be located a clean and ventilated place, but it should not be drafty. The temperature inside of nest boxes should be optimum.



Nest space and design: There should be provision of one nest box per 6 hens. Its design should facilitate a safe and comfortable environment for hens during laying time. There should be easy access to perches and landing platforms. The ideal vertical height of an elevated nest box should be 25.60 inch, not exceeding 35.40 inch. Hens prefer a grid floor platform to wooden slats (Lentifer et al., 2011). Hens show a preference for smaller group nests compared to larger ones, based on more eggs laid in the smaller nest with fewer nest visits per egg (Rinnenberg et al., 2014).

Slope of nest box floor: Nest floors that are excessively sloped may not be comfortable, causing hens to seek alternative nesting sites outside of the system. Commercial colony nests with automatic egg collection generally provide nest floors with 12-degree to 8-degree slopes (Buchwalder and Frohlich, 2011).

Nest floor mats: Floor mats for nest boxes should be clean, intact and comfortable. Rough and torn-out floor mat prevents eggs from rolling down, which stimulates egg-eating behaviour in hens and more cracked eggs.

Distribution of light in the shed and nest box: Light inside the shed should not cast a shadow and should be diffused. The activity area other than the nesting site should be well-lit. The entrance point of nest boxes should be moderately lightened. The area inside of nest boxes should be dark, at least less than 0.5 Lux. Proper lighting in the nest box is applicable only during training or the pre-laying period. It will be discontinued after the hen starts using nest boxes continuously. Nest lights are provided one hour more than shed light, both in the morning and evening time.

Feeding schedule: Schedule the feeding time not to interfere with the pre-laying behaviour and egg laying of the flock. The first feed should be provided to birds when the shed lights are turned on. The second feed should be provided after most eggs have been laid by the flock.

Summary

Nesting behaviours are habituated in the hen soon after egg production begins and once established, become difficult to change. Manage the flock to provide positive early nesting experiences, leading to good nesting behaviours. Design a proper nest box, and eliminate obstacles, interruptions, and negative experiences that might cause hens to lay out-of-nest eggs. These interventions will ultimately enhance egg production in the backyard and deep litter system of rearing.

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