From cages to alternative sys

As a result of the EU-directive for housing laying hens many poultry farmers are looking for alternatives. Most of these have a negative impact on production costs, but all demand a change in management. Farmers must learn new management skills.

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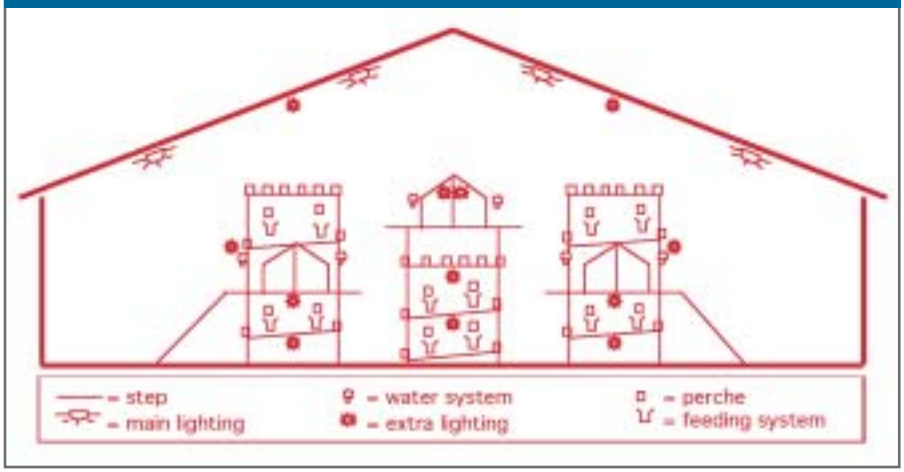
Figure 1 - Example of an aviary system with an ideal layout



Prior to the new EU-directive for housing laying hens, the Dutch government is promoting the transition from battery cages to alternative systems such as deep litter systems and aviaries. The shift from system management in battery cages to bird management in alternative systems will present farmers with some difficulties that must be overcome. These difficulties are related to more and heavier labour, a higher incidence of floor and system eggs, management difficulties, higher NH_3-emission, higher disease risk, higher dust concentration and increased cost price of the eggs. With this article we offer advice on how to manage birds in order to achieve satisfactory production results.

Rearing period

For management of all laying birds there is a golden rule: make it as easy as possible for the birds. Especially the transition from rearing farm to production units is critical. Water and feeding systems during rearing should match the systems during the production period. Especially water is crucial. If the colour of the drinking system during rearing is the same compared to the colour of the drinking system during the production period, the birds will find the water more easily. Also the feeding systems should match closely, and even the colour of the farmers' clothes may scare the birds. A radio playing constantly avoids panic at unexpected noises. It is important to go and see the birds and the systems at the rearing farm before the birds are transported. In fact, it is even more important to make these important choices before the birds are ordered and born. In a 3-dimensional aviary system the birds have to find water, feed, laying nests and perches. This can already be stimulated during rearing by:

- Having the lowest level in the aviary system higher than floor level
- Do not lock up birds longer than 3 weeks in the system during the beginning of rearing
- Closing the water supply at the lowest level after 10 weeks of age

Birds that are reared for alternative systems and especially for free-range, require respectively 25-50 and 50-100g higher body weight at 17 weeks compared to birds that are reared for cages. Birds in alternative systems need more reserves because of their increased movement and temperature variations. Birds that start the production period in alternative systems at too low body weight are more often subject to burnouts. Beak trimming should occur before 10 days of age and delayed light stimulation result in birds that gain more weight during the rearing period. These birds start to lay their first egg later and also the moment of peak production is delayed.

Laying period

During the first week in the production house, the lighting programs at the rearing farm and production house should match. Birds that are stressed during transport require a higher house temperature that will also enhance good distribution of the birds across the house. It is better to move the birds not later than 17 weeks to give them time to check out the production house as to where to lay the eggs to avoid floor and system eggs. Birds should be placed at the different levels and preferably in the morning, so that they have the opportunity inspect the area to find water and feed. When birds are placed late in the afternoon, the lighting program should be adjusted in order to give the birds enough time. Light intensity at bird level at the floor should be at least 20 lux. It helps the birds to find the different levels later in the production period if they are put manually at the different levels just before darkness for a minimum of 5 days. Water remains of crucial importance so special attention should be given to dehydrated birds. These can be recognised by their dirty beaks because they ate manure to attain at least some moisture.

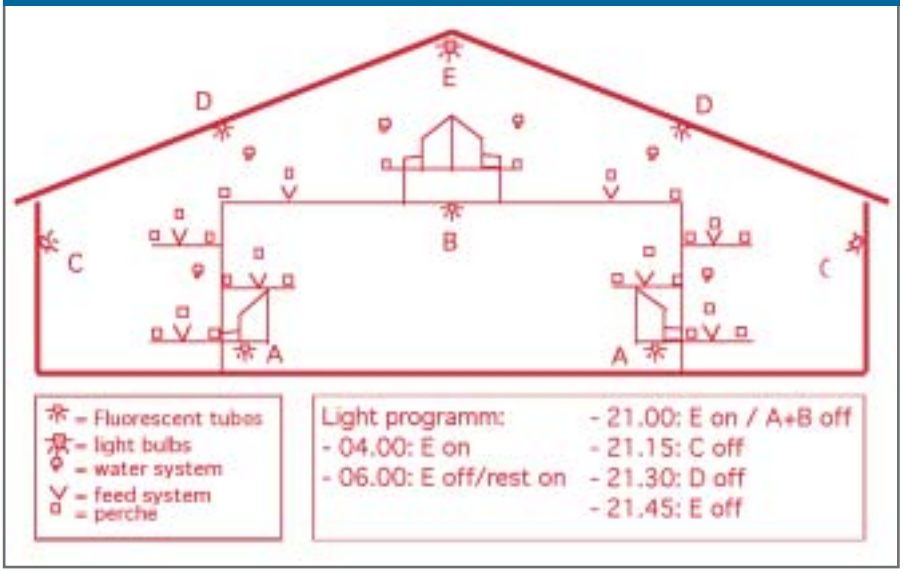
Floor and system eggs

The layout of the aviary system is of great importance to avoid or control the incidence of floor and system eggs. In the period 2001-2002, the Research Institute for Animal Husbandry conducted an inventory on commercial farms with aviaries with free-range. Floor eggs incidence was 2.0% and ranged from 0.4% to 5.6%; somewhat lower compared to the results of

Alternative systems often require more intensive labour.

tems requires different skills

Figure 2 - Example of a lighting program in an aviary house with twilight periods (morning and evening) and "phase" lighting in the evening



the inventory in 1996: 3.5% floor eggs. Older systems (>3 flocks) appeared to have more difficulties with floor eggs (2.3%) compared to young systems (≤ 3 flocks; 1.2%).

According to the farmers' suggestions and advice, aviary systems should have the following specifications for good results (*Figure 1*):

- No water or feeding system in the litter area
- Water system near the nests
- Nests integrated in the system to stimulate vertical distribution
- "Zig-zag" structure between systems enhances vertical movements
- Distance between systems no more than 1m
- Feeding and water systems at different levels
- Upward movements stimulated by extra levels, perches, stairs, etc.
- Lowest level on floor level
- More than 100 cm^2/bird nest space

Bird management

The layout system interacts with management measures that can be taken at bird level in order to reduce the incidence of floor and system eggs. Birds that are locked within the system for the first 3 weeks have the opportunity to fully discover it. If birds see floor eggs they will produce another. So collecting floor eggs at least 5 times per days helps to avoid more floor eggs.

If the floor and system eggs are placed inside the nests where the birds can see them, it will help the birds find the nests more easily. Nests should be accessible between 2 hours before switching on the lights and be closed 1 hour before switching off the lights. Best is to provide the birds at 16 hours of light and some twilight in the morning and evening hours to tell them to go to their nests to lay their eggs soon. At the onset of the laying period, when the birds are still young, they have the tendency to produce eggs in the night. In dark-out houses in particular these young birds have difficulties finding their nests and therefore may lay their eggs on the floor or in the system. One (switched-on) light bulb per 10m length of the house will prevent these floor and system eggs. The same light bulbs can be used to guide the birds to the perches when the lights are shut down in the evening. Dark spots should be prevented and gradually turning the lights off from floor to the upper system stimulates vertical movement of the birds (*Figure 2*).

Appropriate litter management should avoid birds using litter for nesting material. Distribution of the birds across the system is important to avoid mortality but also to avoid floor and system eggs. Birds often wait for the first and highest nests and if other hens are using these, more eggs are laid at the floor or in the system. In aviary systems with two nests on top of each other, the lower nest should be adequately lit. Also the presence of water or feeding systems in front of the lower nests decreases the incidence of floor and system eggs.

Egg quality

Data from commercial alternative systems indicate that egg quality can be as good or even better compared to battery cages. Often less dirty and cracked eggs are found in the alternative systems. The incidence of dirty and cracked eggs depends mainly on the type of system used and the number of floor and system eggs

The free movement of birds may cause more eggs to end up on the floor and on the system slats.

If the colour of the drinkers in the system is the same as the colour used during rearing, birds will find them more easily.

Table 1 - Technical results of brown hens in different types of housing systems

	Cage	Aviary/Deep litter	Free range
Production period (days)	385	385	375
Egg (per hen housed)	317	316	302
Kg (feed/kg egg)	2.11	2.25-2.32*	2.39
Feed consumption (g/h/d)	112	120-124*	127
Mortality (%)	6	8	11

* First figure is aviary and the second deep litter

correlate highly with the number of dirty and cracked eggs. Nests should be closed during nighttime to avoid soiling of the nest floor.

Sufficient nesting space per bird and a proper distribution of the birds across the house is essential for high production rates and good egg quality.

The distribution of chicks and feed through the house also depend on the speed of the feed chain. Frequent feeding times and feed distribution from multiple feeding chains and silo's prevent flocking and overcrowding and are crucial to achieve and maintain a uniform flock and high production rates. Feed the birds to their requirements for good egg quality by using phase feeding during the production period. Birds in alternative systems require a higher nutrient and energy intake because they have increased activity and need to deal with temperature variations.

Birds in aviary and deep litter systems require 10g more feed per day and birds in free-range require 15g more feed per day (*Table 1*). Also the average technical results of laying hens in different housing systems in The Netherlands are given. Production period is 10 days shorter in free-range flocks compared to hens in battery cages resulting in a lower number of eggs per hen housed. Due to the higher feed intake, feed conversion ratio is also higher in alternative and free-range systems. Finally, also mortality rates are higher in alternative and free-range systems.

Summary

The transition from a battery cage to any alternative system for laying hens comprises more than just the system. It also involves a shift from system management to bird management. For framers who are willing to learn more on how to manage their birds, there is a fantastic challenge to leave the battery cages and switch to an alternative system. More and more knowledge is being gathered to assist farmers with their new alternative systems and bird management. ■

Birds that start the production period in alternative systems at too low body weight are more likely to suffer from burnout.