Question to EURCAW-Poultry-SFA

Reference of the query: Q2E-Poultry-SFA-2023-011
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Background context provided by the solicitor

In aviary systems for rearing laying hens, it is usual to lock the pullets on the grids on the first two levels of the aviary for the first three to five weeks of their life so that they can find food and water more easily. A kind of paper is placed on the grids, so that there is no direct contact of the pullets with the grid in the first days. On the paper, food is sprinkled on it. Depending on the quality of the paper, it dissolves over time and is also pecked by the animals. Then the animals stand directly on the grid floor. After about three to five weeks the pullets can use the whole aviary system. This common practice of keeping pullets does not correspond to the goal of the "End the Cage Age" initiative.

Question

Are there any recommendations on flooring and enrichment to improve exploratory and comfort behaviour in the first weeks of pullets' life to mitigate or avoid future behaviour problems? How many weeks is it actually necessary to lock the pullets in the aviary?

Answer

The practice of temporarily restricting pullets in aviary systems preventing them from accessing to litter is common in commercial rearing farms (with the pullets enclosed inside the system for up to five weeks).

To our knowledge, there isn't available research about how many weeks is needed to lock pullets inside the aviary. Farmers keep this practice to **ensure good access to drinkers and feeders,** and to **force animals to explore the system environment**. Sometimes, a similar practice is done when pullets first enter the laying facilities, for the same reasons plus for the birds to learn to nest in designated areas and reduce floor eggs. Both practices involve denying access to both litter and a substantial amount of space and could be detrimental for the welfare of the animals, but research about this is scarce. According to Alm et al., 2015, excluding access to the litter area for 2 weeks in pullets when introduced to the laying facility (16 to 18 weeks of age) resulted in better feather cover and reduced fearfulness. However, these results could be attributed to a smoother transition from

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rearing to laying facilities regarding **density** (the exclusion from the litter area resulted in a similar stocking density from rearing, but in the other treatment animals were subjected to an abrupt decrease in stocking density) and highlight the importance of a good transition between rearing and laying.

High stocking density during rearing is described as a risk factor for developing feather pecking during the rearing period (Bestman et al., 2009). Rearing pullets at lower stocking densities reduced plumage damages during rearing and also improved feather condition in the laying period (Bestman et al. 2009). Lock pullets inside the aviary during few weeks could mean a high density. However, it seems that chicks can be kept at high densities in the first 2 weeks of life (approximately 100–120 birds/m^2) which enables them to keep warm, without consequences in the plumage condition (EFSA, 2023), so the problem would appear when they are locked up to 5 weeks. The longer the duration locked, the smaller the remaining space due to pullet's body increasing. EFSA (2023) recommends a density of maximum 40 pullets/m^2 from 3-6 weeks of age (until day 42 of age).

The rearing period is crucial to prepare the birds for the challenges they will encounter during adulthood, and there is evidence that pullets should be reared **in a system as similar as possible to the later laying housing system.** Particularly for complex multi-tier systems, pullets need to develop sufficient adaptive skills (Giersberg and Rodengurg, 2023). In this sense, it is recommended to propose to the birds a complex rearing system, as similar as possible to the one they will encounter in the laying phase, and not being floor-reared only.

On the other hand, the **need for litter from day one** is stressed out in the literature (Mels et al.2022), because it can have long-term impacts on the development of feather pecking behaviours and plumage damage (which may be related to litter stimulating natural foraging behaviour). Early access to litter is important for promoting foraging, dust-bathing and pecking behaviour and avoid stress and frustration during rearing (Bestman et al., 2009; Michel et al., 2022). If appropriate substrates are not present in early life, proper development of the dustbathing sequence may not occur, even if litter is presented later in life and if no other suitable substrates are available, birds may view feathers as an acceptable material in place of more appropriate alternatives (see Q2E-Poultry-SFA-2022-008 for more information). Since sham dustbathing does not fulfil behavioural and functional needs, pullets or hens may continue to experience negative affective states or other welfare issues (Olsson and Keeling, 2005).

The use of **paper substrate** in rearing is a practical option to provide some litter inside the aviary system in the first weeks of rearing. It is recommended by the voluntary initiative group on pullets under the EU Platform on Animal Welfare (Voluntary initiative group for the welfare of pullets, 2021), and EFSA (2023) consider that chicks may be kept on paper or other solid substrates from days 1 to 6 or until feeding behaviour is established. When housed on wire (in cages or aviaries tiers), the paper covering the floor prevents the legs of young animals from falling through the wire

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mesh, improves survival (it improves the access to food and water), and allows provision of some foraging substrate. The use of paper encourages feeding because food particles can be more easily differentiated and because rustling and tapping noises produced by walking and pecking stimulates feeding (EFSA, 2023). Providing paper during rearing also seems to reduce fearfulness in adult hens if the pullets didn't receive other environmental enrichment as adults; but enrichment given to adult hens counteracts the negative effects of not having access to paper early in life (Brantsaeter et al. 2017). Moreover, it also provides the required faecal contact for a successful coccidiosis vaccination and reduces anxiety reactions among the layers (Pierson et al.1998, reviewed in Xu et al. 2022). The paper substrate allows for faeces and other particles (dust, spilled food) to accumulate, creating some sort of litter. However, it also increases the risk of diseases if not managed correctly, so adapted vaccination regimes and checking of the hygienic quality of the litter are crucial (Brantsaeter et al. 2017; Schwarzer et al. 2022). This paper-dust-faeces particles mix doesn't provide the same litter quality than using straw, wood shavings or other suitable substrates directly on the floor. Indeed, Mels et al. (2022), in a study aiming to identify risk factors for plumage damage as a proxy for feather pecking, showed that confining pullets in aviaries even with the use of chick paper does not provide a sufficient foraging and pecking substrate and resulted in more plumage damage and the occurrence of bloody lesions than when pullets were floor-reared access to litter in the first weeks. So, even with the use of chick paper, access to other enrichments is recommended to promote foraging and pecking behaviour.

Although research on **rearing enrichments** on a practical level is limited, providing enrichment during rearing seems beneficial for the pullets because can improve plumage and skin quality in the laying period and can help maximise the pullets' physical, sensory and behavioural development potential (Giersberg and Rodengurg, 2023; Schwarzer et al. 2022; Xu et al., 2022). This is especially important for birds that will be housed in complex environments during the laying period. Structural – basic– enrichments such as perches or elevated platforms should be available from the beginning, because they are necessary for optimal skeletal development (Campbell et al., 2019). Pecking enrichments, perches and litter, or accessible ground area (plus ramps) during rearing enhance bird development to suit alternative systems. Enrichments may increase the performance of natural behaviours, reduce incidence of abnormal and damaging behaviours, reduce negative emotional states, improve physical health and improve the use of the provided environmental resources (Giersberg and Rodengurg, 2023). However, more access to enrichment during rearing does not seem enough to eliminate the risk of feather pecking, as other factors such as an adequate diet and sufficient space allowances have to be considered as well (Giersberg and Rodengurg, 2023).
When the pullets are locked inside the system, the most practical enrichments seem to be pecking stones or blocks (if needed, they can be split and offered in one-half or one-quarter according to the space and number of animals). Small bricks of hay bales could also be used (Figure 1).

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General recommendations about density:

- Avoid high stocking densities from 3 weeks of age. EFSA (2023) recommends a density of maximum 40 pullets/m^2 from 3-6 weeks of age (until day 42 of age).

General recommendations about flooring:

Avoid direct contact of chicks legs with wire mesh:
by providing paper on the grid. In that case:

- Check and maintain good hygienic conditions of the chick paper area.
- Check when the chick paper fades away to provide either access to litter or other alternatives to express foraging, dust-bathing and pecking behaviours.

or, by rearing chicks directly on the floor with suitable litter. In that case:

- Provide easy access to feed and water for all birds from the floor,
- Encourage birds to explore the complex environment by providing ramps for instance, and adequate luminosity.

General recommendations about enrichment during rearing:

- Basic enrichment, as perches or elevated platforms, should be available.
- Enrichment should be in line with particular features needed to adapt to the later laying hen housing system i.e. ramps for multi-tier systems (to help navigate between the tiers)
- Similar enrichment items should be provided during the laying period (i.e. pecking stones or blocks, hay bales…)
- Effective enrichments include: straw and hay bales; perches, ramps and platforms; novel food for pecking; pecking blocks; pecking objects (like textile strings); dustbathing boxes.
- Pecking stones and blocks are easy to use inside the system.
- Any items which are not well used by the birds should be replaced by alternatives.

Figure 1: Small pecking stones and alfalfa bales used as enrichment materials in chicks (Source: Schreiter et al., 2019)

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Conclusion

This topic is complex and literature is scarce for some of the questions. EURCAW-Poultry-SFA is planning a bigger review about pullet welfare in 2025.

At the moment, to improve exploratory and comfort behaviour and limit further damaging behaviours (such as feather pecking), it is recommended to limit the practice of locking the animals inside the aviary system for the lowest time possible, and always provide paper substrate in combination with enrichment. To encourage animals to explore the system environment which will later help the birds to make good use of the entire area, provide adequate resource management such as ramps, and adequate luminosity. Stocking density should be appropriate as pullets grow. Hygiene and presence of the paper should be checked regularly. Enrichments should be adapted to the laying environment that the animals will encounter in the future and changed if the animals do not use them.

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