GPFS-Poultry-SFA-2024-03-EN
Version 1 – September 2024
https://doi.org/10.5281/zenodo.13860273

Early litter access for pullets housed in aviary systems

ANIVET

Why early litter access is important

Chicks start ground pecking the day they hatch, and on day 2 or 3 ground scratching appears, always in close association with ground pecking (Hogan, 1971). Ground pecking and scratching, i.e. foraging behaviour, take up a considerable amount of the time budget from early life of a chick. Likewise, dustbathing behaviour consists of several motor components that develops gradually over the first 12 days posthatch (Kruijt, 1964) and will become integrated into normal coordinated dustbathing behaviour by the end of week 3 (Larsen et al., 2000).

Fig. 1: Three-day old layer chick performing foraging behaviour in a bedding consisting of sand and wood-shavings. *Source: ANIVET*

Ground pecks performed during both foraging and dustbathing are directed towards the bedding material (Fig. 1). If there is no appropriate substrate available, the behavioural needs of the chicks are not fulfilled, which may cause long-term negative affective states (de Haas et al., 2014; Brantsæter et al., 2017). In addition, lack of suitable substrate during early rearing may result in ground pecking being redirected to the downs or feathers of conspecifics, causing development of injurious pecking, which may continue throughout the rearing period and into the laying period (Johnsen et al., 1998; de Haas et al., 2014).

Common practise in aviary systems

When rearing pullets in an aviary system, the common practice is to lock the chicks into the aviary structure during the first 3-5 weeks. This is done to ensure that the chicks have access to feeders and water nipples, which are integrated into the aviary structure. However, the disadvantage is the lack of solid floor, as the flooring in the aviary tiers consists of plastic or galvanised wire slats. Therefore, for the chicks to have access to litter during this period, special initiatives are needed.

How to ensure litter access during early pullet life in an aviary system

Chick paper

Chick paper should always be placed in the aviary tiers before the chicks are placed (Fig. 2). For chicks vaccinated against coccidiosis at the hatchery, a solid floor is important for proper effect of the vaccination as development of immunity requires the chicks to ingest the oocysts that are shed via faeces. Feed is spread on the paper to encourage foraging. Over the days, faeces, dust and downs accumulate on the chick paper, before the paper starts to dissolve.

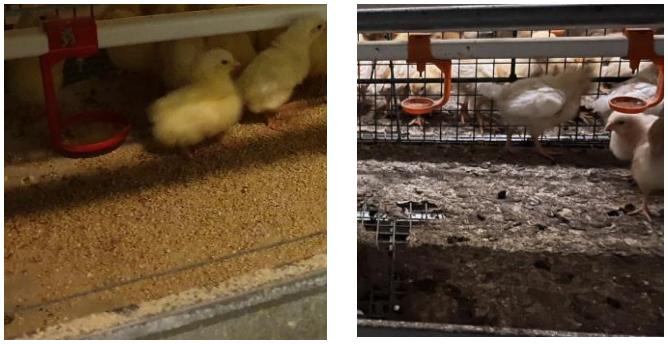

Fig. 2: Chick paper with feed on day 1 (left) and day 10 (right). *Source: ANIVET*

Early litter access for pullets housed in aviary systems

Trays with substrate

To ensure litter access of high quality, trays with substrate can be placed in the aviary tiers. Trays are usually made of disposable material (e.g., cardboard), not posing a biosecurity risk, and may be custom made or have a different original purpose (e.g., egg trays). Alternatively, plastic trays are easily cleaned for reuse.

A substrate should be added into the trays (Figs. 3 and 4). Different materials may be used, but for optimum use at least part of the material should consist of small particles. Examples of suitable material are finely chopped straw or alfalfa, sand, granulated pellets of straw, granulated mineral, peat, saw dust and wood-shavings. Some of the materials have the advantage of being heat treated (e.g., granulated straw pellets), increasing biosecurity.

The trays must be refilled regularly to ensure continuous access to high-quality litter, as the substrate will gradually disappear due to the activities of the chicks. Depending on the types of trays, substrates, pullet age and genotype, refilling may be required as often as every second day. Refilling usually requires manual work, so time has to be allocated for this. Some types of substrates can be distributed by screw conveyors. However, these remain to be integrated into aviary structure currently used for rearing pullets.

Little is yet known about the littered area needed for layer chicks to have sufficient access during the period they are locked into the aviary structure. One suggestion, based on practical experience, is to use three cardboard boxes, each measuring 100 × 20 × 7 cm (L × W × H), per 1000 chicks. This allows most chicks access, while also being feasible for a farmer caring for 40000 chicks. A height of 7 cm allows the day-old chicks to access and depart the boxes, while also retaining the litter in the boxes as long as possible.

Fig. 3: Scan the QR code to see the recordings of 10-day old layer chicks foraging and dustbathing on an egg tray containing granulated mineral and chopped alfalfa. *Source: ANIVET*

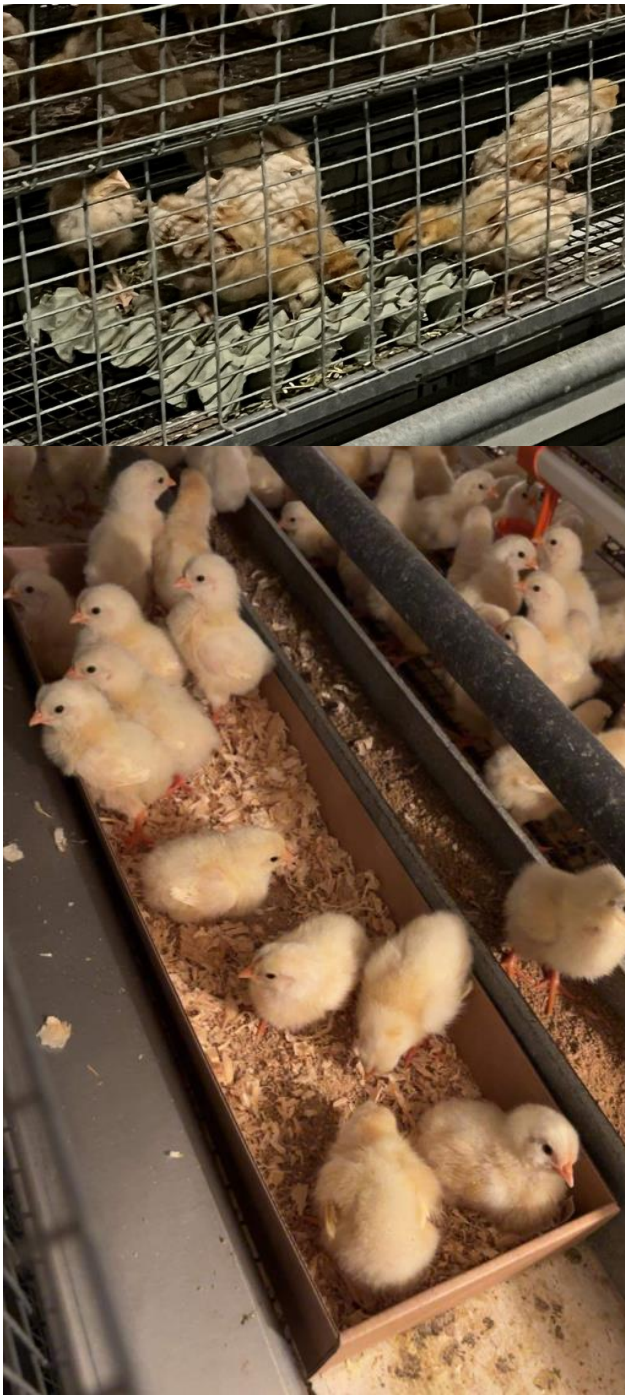

Fig. 4: Egg tray containing granulated mineral and chopped alfalfa (top) and cardboard tray containing wood shavings and feed (bottom). *Source: ANIVET (top)/ANIMALIA (bottom)*

When released from the aviary tiers

Chicks should be released as early as possible from the aviary tiers. Disposable trays and the remains of the chick paper should be moved down to the littered floor for the pullets to continue using the materials as pecking objects until they are completely dissolved.

Early litter access for pullets housed in aviary systems

References

BRANTSÆTER, M., TAHAMTANI, F. M., NORDGREEN, J., SANDBERG, E., HANSEN, T. B., RODENBURG, T. B., MOE, R. O. & JANCZAK, A. M. 2017. Access to litter during rearing and environmental enrichment during production reduce fearfulness in adult laying hens. Applied Animal Behaviour Science, 189, 49-56.

DE HAAS, E. N., BOLHUIS, J. E., KEMP, B., GROOTHUIS, T. G. G. & RODENBURG, T. B. 2014. Parents and early life environment affect behavioral development of laying hen chickens. Plos One, 9, e90577.

HOGAN, J. A. 1971. The development of a hunger system in young chicks. Behaviour, 39, 128-201.

JOHNSEN, P. F., K.S., V. & NØRGAARD-NIELSEN, G. 1998. Influence of early rearing conditions on the development of feather pecking and cannibalism in domestic fowl. Applied Animal Behaviour Science, 60, 25-41.

KRUIJT, J. P. 1964. Ontogeny of social behaviour in Burmase red junglefowl (Gallus gallus spadiceus) bonnaterre. Behaviour, Suppl XII, 1-201.

LARSEN, B. H., VESTERGAARD, K. S. & HOGAN, J. A. 2000. Development of dustbathing behavior sequences in the domestic fowl: The significance of functional experience. Developmental Psychobiology, 37, 5-12.

Co-funded by the European Union

anses

IRTA Institute of Agrifood Research and Technology

AARHUS UNIVERSITY

IZSLER