



Arrangement of perches and feed troughs in aviaries for laying hens and housing systems for broiler breeders

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Key words

Perches, aviary systems, feeders, laying hen, broiler breeder, behavior, health, production, animal welfare

Aim of the study

This study comprised two projects (A1-3 & B1-3) related to perch use and feeder space in poultry. The aims of experiments within Project A were to (i) assess how the provision of elevated “perch-feeders” affects behavior, welfare, and production compared to normal feed troughs with platforms as access, and to (ii) assess the minimal feeder space for laying hens in aviaries. The aims of experiments within Project B were to (i) investigate the types and heights of perching structures broiler breeders would use during rearing and production and (ii) how their provision would affect behavior, health, and production.

Material and methods

For Experiment A1, twenty pens each containing 196 hens were assigned either to the perch-feeding system or standard platform system and assessed for feather score, body mass, and keel damage at 21, 44, and 65 weeks of age. Video observations to quantify aggression and feeding behavior were assessed at 30, 37, and 51 weeks of age as well as production at the pen level over the entire flock period. The same barn was used for Experiment A2 where 5 feeder spaces (4, 6, 8, 9, 10 cm/hen; n=4 pens/feeder space) were compared. Video recordings to assess aggression and feeding behaviour were made at 21, 32, 39, and 45 weeks of age while production data was collected at pen level for the entire experiment. Experiment 3 was based on the theory of ideal free distribution (IFD), according to which animals should distribute themselves across multiple feeding sites proportional to the amount of feed available in each, but that distribution should deviate from IFD when there is either no completion for food (plenty of feeder space) or when competition is too fierce (not enough feeder space). Thus, 10 identical pens, each containing 26 hens and two feeders, were used, and over the course of 20 weeks and at weekly intervals, each pen was assigned one of 5 feeder spaces (4, 8, 10, 18, 27 cm/hen) and total feeder space allocated to the two feeders in ratios varying from 1:1 to 1:10 in a stratified manner. Each week, following 3 days of habituation the distribution of hens across the feeders and levels of aggression were assessed from video recordings.

For Experiment B1, we converted two commercial broiler barns into broiler breeder facilities and compared the effects of three treatments (control, perches, aviary; n=3 per barn) on perching behavior, health and production in a relatively slow (Sasso) and a fast growing hybrid (Ross 308) every five weeks from 5 to 45 weeks of age. For Experiment B2 we focused on Ross 308 to assess the effects of varying perch space (5, 10, 15, 20 cm/bird, varied every 4 weeks in a stratified manner) compared to control pens without perches (n=4 pens per treatment) on perch usage, health, and production. In Experiment B3, chicks (N=2160) from parent stock of B2 with and without perches were raised under commercial conditions and body mass assessed daily.

Results and significance

Experiment A1 found the perch feeding system to be associated with a small but significant decrease in aggression with no productivity differences, suggesting that perch feeding systems are a viable alternative to conventional feeders. Comparison of feeder space in Experiment A2 found a significant decrease in aggression with increasing feeder space, but at the cost of a slight decrease in feed efficiency (feed/egg). In Experiment A3, birds distributed themselves according to IFD at feeder spaces of 8 and 10 cm/hen (as required by CH and

EU, respectively), while distribution deviated from IFD at smaller (4 cm/hen) as well as larger feeder spaces (18 and 27 cm/hen), and feeder space of 4 cm/hen, but not 8-10 cm/hen, was also associated with increased aggression, indicating that hens are able to cope with feeder spaces of 8-10 cm without negative effects on aggression.

In experiment B1, both hybrids used the perches and aviary tiers (especially at night during roosting) confirming that broiler breeders were motivated to use elevated perches. More eggs were produced in control pens, but this difference may be explained by the high rates of floor eggs, especially in aviary pens. In Experiment B2, neither the number of eggs nor hatchability was affected by treatment. Perch use initially increased with increasing perch space, but decreased strongly with age. Experiment B3 did not reveal any effects of parent treatment on the growth of the broiler chicks. Taken together, these results suggest that broiler breeders are highly motivated to use elevated structures for perching, but that pen design (type and arrangement of elevated structures) is important for adaptive perching behavior, while management practice (avoidance of floor eggs) is crucial in view of avoiding negative effects on egg production.

Publications, posters and presentations

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Project 2.13.10

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