



Effects of panels and perches on the behaviour of commercial slow-growing free-range meat chickens



Ane Rodriguez-Aurrekoetxea^a, Erin Hoerl Leone^b, Inma Estevez^{a,c,*}

^a Neiker-Tecnalia, Arkaute Agrifood Campus, 01080 Vitoria-Gasteiz, Spain

^b Florida Fish and Wildlife Conservation Commission, Fish and Wildlife Research Institute, Gainesville, FL USA

^c IKERBASQUE, Basque Foundation for Science, Maria Diaz de Haro 3, 48013 Bilbao, Spain

ARTICLE INFO

Article history:

Accepted 1 February 2015

Available online 9 February 2015

Keywords:

Environmental enrichment

Panels

Perches

Behaviour, Free-range meat chicken

ABSTRACT

Environmental enrichment has the potential to benefit the welfare of farm animals. In poultry, panels and perches are two of the most commonly used forms of enrichment but few studies have determined their effects under commercial conditions. The aim of this work was to assess the impact of these forms of enrichment on the behaviour of slow-growth free range meat chickens. The study was conducted in four commercial farms each with 3900 birds, housed in three independent houses with access to an outdoor area. One house in each farm was outfitted with indoor and outdoor panels, the second with perches, and the third house was used as a control and had no enrichment. In each house 40 birds were tagged for individual recognition. Focal observations were performed from 6 to 12 weeks of age, with thirty 5 min focal samples collected in each house in the indoor and outdoor areas alternatively. In addition, the location (in XY coordinates) of tagged birds inside and out, and their behaviour, was also collected. We did not find a main effect of treatment on the behaviour inside or outside the house ($P > 0.05$). However, the interaction between treatment and week of age for standing ($P < 0.05$) indicated a general increase with week of age only for the perch treatment inside the houses, and for only the perch and control treatments in the outdoor area ($P < 0.05$). Resting decreased until week 9, while locomotive behaviours increased until week of age 10 in the outdoor area ($P < 0.05$), with both trends reversing afterwards. A higher percentage of birds performed locomotive behaviours more often in the central area of the house in the panel treatment as compared to the control ($P < 0.05$), with perch treatment showing intermediate values. Overall, environmental complexity had a limited effect on the behaviour of slow-growth meat chickens, although the perch presence translated into a higher percentage of standing. It is likely that the reduced effects of the environmental enrichment treatments would have been greater if more devices were introduced.

© 2015 Elsevier B.V. All rights reserved.

1. Introduction

The physical environment of commercial chicken farms tends to provide limited protection areas with the exception of walls, bell drinkers and feeders that birds may use as 'cover' for protection. The lack of protective areas frequently results in birds clustering along the walls, leaving unused space in the centre of the houses (Newberry

* Corresponding author at: Neiker-Tecnalia Arkaute Agrifood Campus, P.O. Box 46, E-01080 Vitoria-Gasteiz, Spain. Tel.: +34 945121336; fax: +34 902540547.

E-mail address: iestevez@neiker.net (I. Estevez).

and Hall, 1990; Cornetto and Estevez, 2001a; Buijs et al., 2010; Rodríguez-Aurrekoetxea et al., 2014). When birds have access to an outdoor area, even though it may offer a wide variety of behavioural opportunities, a few dispersed trees may be the only structure that can be used for protection. A deficiency of areas where the birds can feel safe often results in a high reluctance of the birds to move away from the chicken house (Grigor and Hughes, 1993; Dawkins et al., 2003) where they can shelter in case of any perceived danger. This uneven use of indoor and outdoor space leads to a difference in the effective density of birds throughout the space which may lead to some problems such as increased disturbances in the wall area (Cornetto et al., 2002), overuse and erosion of the outdoor areas closer to the house (Breitsameter et al., 2014), or an excess of nutrients in such areas (Aarnink et al., 2006).

The provision of cover offers to animals' visual isolation from predators or conspecifics, a suitable habitat for resting, and protection from weather conditions (Elton, 1939). Because of these benefits, different forms of cover have been broadly used in captive animals with positive effects on their behaviour (Estep and Baker, 1991; Whittington and Chamove, 1995; Holierhoek and Power, 1995). In broiler chickens and layers, provision of panels indoors has been shown to be effective at modifying birds' behaviour, increasing their motivation to explore new areas and stimuli, improving the use of central underused indoor areas, and reducing the incidence of disturbances (Newberry, 1995; Newberry and Shackleton, 1997; Cornetto and Estevez, 2001a; Cornetto et al., 2002). A study on the effects of panels in commercial broiler breeder houses found increased male home ranges, improved female reproductive performance and a consequent economic benefit for farmers (Leone and Estevez, 2008).

Roosting is a natural behaviour of both jungle (Collias and Collias, 1967) and the domestic fowl (Blokhuis, 1984). Perches offer birds the possibility to use the third spatial dimension, and can increase movement and exercise while jumping on and off of them as birds move around (Bizeray et al., 2002). Several studies have investigated the use of perches by broiler chickens with variable results (LeVan et al., 2000; Bizeray et al., 2002; Ventura et al., 2012). The highest perch use was found in the study by Ventura et al. (2012) with up to 25% of perches used during the day at 4 and 5 weeks of age. Nonetheless, perch provision can have additional benefits as it has been shown to decrease the frequency of disturbances and aggressive interactions and to improve the use of central areas (Ventura et al., 2012), similar to the findings by Rodríguez-Aurrekoetxea et al. (2014). Therefore, using panels and perches to make the outdoor areas more complex and interesting for slow-growing meat chickens may increase their usage by the birds.

It has been shown that in free-range broiler chickens, the use of the outdoor area depended on environmental factors such as temperature, sunlight, or tree cover (Dawkins et al., 2003). Nevertheless, even under optimal weather conditions the use of the outdoor areas was shown to be low with a maximum of 14.3% of use (Dawkins et al., 2003). It is possible that increasing the complexity of the environment, favouring vertical space use, and providing cover in the outdoor areas may encourage greater

use of outdoor space and a wider behavioural repertoire, especially in more active slow-growing meat chickens. Additionally, the presence of the same enrichment devices inside and outside could improve the use of the outdoor area as a consequence of imprinting or familiarity (Grigor et al., 1995). Therefore, providing the same enrichment inside and in the outdoor area could be a good strategy to increase use, dispersion, and activity in the outdoor area.

The aim of this study was to determine the potential benefits of panels and perches both indoors and in the outdoor areas on the behavioural activity of slow-growth free range meat chickens under commercial conditions. We predicted that perches and panels would modify the time that birds spent performing different behaviours and the location in which they were performed. Also, we expected an increase in the variety of behaviours that birds performed in the outdoor areas.

2. Material and methods

2.1. Farms and animals

Four commercial free-range slow-growth meat chicken farms were selected for this study. All farms had similar features and management because they produced under the Eusko-Label Certification Program. The birds in all four farms were slow-growth Sasso T44 females, with a minimum rearing period of 82 days which is required by the certification program. The T44 bird is characterized by a lower growth rate as compared to a slow growing broiler chicken that may also be used for free-range production in other regions.

Each farm in the study consisted of three 110 m² houses, each with its own fenced outdoor area measuring approximately 2700 m². Birds had access to the outdoor area from 10:00 a.m. until dusk (19:00–21:00). At each farm a total of 3900 female chicks were housed together for brooding from arrival, on day one, until 5 weeks of age. Then they were divided in equal group sizes of 1300 across the three houses at a density of 12 birds per m² (27 kg/m² approximately). Once birds were moved to their respective rearing houses with the corresponding treatments, 40 random birds per house (120 birds per farm) were tagged in the neck for individual identification. Tags were made of laminated cream paper disks 4 cm in diameter with a unique two digit black number printed on both sides (*modified from Cornetto and Estevez, 2001a*). This study was carried out from March to September of 2012.

2.2. Experimental design

This experiment was designed as a completely randomized block design consisting of three treatments; panels, perches, and control which were assigned randomly to each house. For the panel treatment we placed nine lightweight panels inside the houses and nine panels outdoors. The interior panels were placed in two rows perpendicular to the popholes along the house, at a distance of 2 m from each other. The outdoor panels were placed in three rows, starting 2.5 m away from the popholes, in parallel to the house at 2 m distance from one another. The setup

Download English Version:

<https://daneshyari.com/en/article/6379547>

Download Persian Version:

<https://daneshyari.com/article/6379547>

[Daneshyari.com](https://daneshyari.com)