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# Animal Well-Being and Behavior

**350P Pre-laying behavior and nest substrate preference of laying hens in a cage-free system.** Gabrielle House\*, Kailynn VanDeWater, and Marisa Erasmus, *Purdue University, West Lafayette, IN.*

Enriching cage-free systems with appropriate nesting areas allows laying hens to express a full range of normal behavioral patterns. In particular, nesting areas and nest substrates affect pre-laying behavior and where eggs are laid, and therefore, egg cleanliness and egg quality. Limited information is available regarding the pre-laying behavior and nest substrate preference in cage free systems of Hy-Line W36 hens, which are the most popular genetic line of laying hen in the US. This study examined 1) laying hen preferences for AstroTurf (AT), plastic coated wire (PL), and bare wire (WI) nest substrates and 2) hens' pre-laying behavior. Hy-Line W36 laying hens were housed in groups of 11 in 8 floor pens. Pens contained 3 nests, each containing one of 3 nest substrates (AT, PL, or WI). Behavior of hens was video-recorded over 2 consecutive days at 22 wk of age. Oviposition time and nest preference were recorded for all hens that laid eggs in nests (d 1: 65 hens; d 2: 71 hens total). In addition, 4 focal hens/pen were randomly selected, and pre-laying behavior (nest inspection, scratching, standing, preening and aggressive behavior) was examined for the 60 min. preceding oviposition. Eggs were collected daily and egg location was noted. Data were analyzed using the GLIMMIX procedure (SAS 9.4). Most eggs were laid in nests containing AT ( $82.5 \pm 2.4\%$ ), then the floor ( $10.7 \pm 1.5\%$ ), in nests with PL ( $4.2 \pm 0.8\%$ ) and in nests with WI ( $2.7 \pm 1.4\%$ ) ( $P < 0.0001$ ). Two focal hens (3%) laid in nests with PL. All other hens laid in nests lined with AT. Due to the small number of hens that laid in PL and WI nests, pre-laying behavior could not be compared among nest substrates. The hens spent, on average,  $2.1 \pm 1.4\%$  of their time inspecting nests,  $0.3 \pm 3.9\%$  of their time scratching,  $0.2 \pm 12.9\%$  engaged in aggressive behavior,  $64.9 \pm 0.2\%$  of their time standing,  $10.0 \pm 0.2\%$  of their time walking and  $1.3 \pm 2.5\%$  of their time preening before oviposition. Results indicated that the majority of hens preferred to lay their eggs in nests containing AT. Results may be used to inform recommendations regarding nest substrate in cage-free systems.

**Key Words:** laying hen, cage-free, nest substrate, pre-laying behavior

**351P Differences in cecal microbiota between feather peckers and non-peckers.** Patrick Birkel<sup>1</sup>, Peter McBride<sup>1</sup>, Joergen Kjaer<sup>2</sup>, Aadil Bharwani<sup>3</sup>, Wolfgang Kunze<sup>3</sup>, Paul Forsythe<sup>3</sup>, and Alexandra Harlander<sup>1</sup>, <sup>1</sup>University of Guelph, Guelph, ON, Canada, <sup>2</sup>Friedrich-Loeffler Institute, Celle, Germany, <sup>3</sup>McMaster University, Hamilton, ON, Canada.

Feather pecking presents one of the most severe issues in modern egg production, compromising both welfare and production of commercial layer flocks. It is often associated with feather eating. There is some evidence that ingested feathers affect intestinal microbial metabolites and that ceca might play a significant role in gut fermentation. Ceca have the greatest gastrointestinal microbial populations that include groups such as *Clostridiales* and *Bacteroidetes*, which are known to degrade keratin. We hypothesized that such keratin-degrading bacteria would be more abundant in feather-pecking birds and that bacteria beneficial to the host, such as *Lactobaccillaceae*, would be less abundant in these birds. The aim of the present study was to explore whether laying hens divergently selected for feather pecking differ in their cecal microbiota. At 60 weeks of age cecal samples of 20 high feather pecking (HFP)

birds and 20 low feather pecking (LFP) birds, which received the same diet, were collected. Bacterial community profiling of 16S rRNA and in silico metagenomics was carried out using a modified bar coded Illumina sequencing method on a MiSeq Illumina sequencer. Our results revealed that LFP birds have an increased overall diversity ( $\beta$  diversity) shown by a difference in the Bray-Curtis index ( $R = 0.171$ ,  $P < 0.05$ ). Operational taxonomic unit (OTU) comparisons further revealed the increased presence of *Clostridiae* in HFP and decreased presence of *Lactobaccillaceae* in HFP samples (FDR  $< 0.05$ , Mann-Whitney comparisons). These results suggest that birds performing high levels of feather pecking show a distinct cecal profile compared with LFP birds. Further experiments should be conducted to investigate whether these differences alter behavior in HFP and LFP birds.

**Key Words:** microbiota, laying hen, bacterial diversity, feather pecking

**352P Can Japanese quail male aggressions toward a female cagemate predict aggressiveness toward unknown conspecifics?** Stefania Pellegrini, Leon Condat, Raul Marin\*, and Diego Guzman, *Instituto de Investigaciones Biológicas y Tecnológicas (IIByT; CONICET-UNC) and Instituto de Ciencia y Tecnología de los Alimentos (ICTA), Facultad de Ciencias Exactas, Físicas y Naturales, Universidad Nacional de Córdoba, Córdoba, Argentina.*

The incidence of aggressive behaviors in mature poultry is a topic of high concern from an economic and from a welfare point of view. Herein, we evaluated in Japanese quail whether the level of male aggressiveness expressed toward a female cagemate can predict aggressiveness toward other unknown conspecifics. At 4 wk of age, birds were housed in 90 male-female pairs in breeding cages. Aggressive and reproductive behaviors were recorded when birds were 11 to 12 wk of age, in 20 min observations along 9 d. Males were classified as either high or low female peckers according to whether they directed more than 5 or no pecks toward their female cagemate (H-FP and L-FP males, respectively; 15 males in each group). At 16 wk of age, social interactions between 1 H-FP and 1 L-FP male were evaluated during 10 min in a novel environment with an audience (behind a wire mesh partition) of 2 unknown female conspecifics. According to the male aggressive performance, 13 of the 15 H-FP males were winners of the interactions and also performed a higher ( $P < 0.01$ ) number of pecks than L-FP males at the females through the mesh partition. Findings suggests that male homecage aggressive performance toward its female cagemate may have predictive value about their aggressive performance with unknown males and also with other females in an unfamiliar surrounding environment. Interestingly, a negative relationship was also found between the number of home cage pecks from male to female and the female plumage condition suggesting that male aggressive profile could also be identified by evaluating the female plumage condition. Further studies aiming to improve the assessment of female plumage condition in relation to male aggressiveness are needed to assess whether this variable can be used as a diagnostic tool of overall male aggressiveness.

**Key Words:** Japanese quail, agonistic behavior, female aggression

**353P Unexpected results when assessing underlying aggressiveness in Japanese quail using photocastrated stimulus birds.** Jorge Caliva, Jackelyn Kembro, Stefania Pellegrini, Diego Guzman, and Raul Marin\*, *Instituto de Investigaciones Biológicas*